AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under act of March 3, 1879.

Volumne 87
Number Seven
$1.00 a Year.

MAY, 1923

Published monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

Fafnir Single Ball Bearing Self-Aligning Pillow Blocks are standard equipment on the warp mills manufactured by the Germantown Machine Works, Philadelphia, Pa.

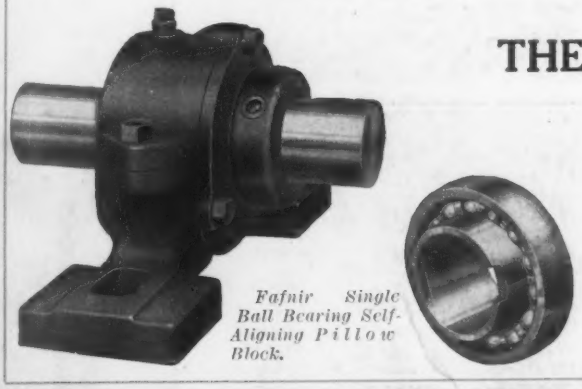
FAFNIR

ADAPTABILITY

A prominent feature of *Fafnir Transmission Ball Bearings* is their ready adaptability to all kinds of machines and power transmission units.

For example, you need only glance at the accompanying illustrations to appreciate the simplicity and effectiveness of this warp mill application of *Fafnir Single Ball Bearing Self-Aligning Pillow Blocks.*

If you are a mill operator, you can save power and increase the efficiency of your plant by replacing your present bearings with *Fafnir Ball Bearing Boxes;* if you are a machine manufacturer, *Fafnir Boxes* will improve your product and help increase your sales.



Fafnir Single Ball Bearing Self-Aligning Pillow Block.

THE FAFNIR BEARING CO.

(Conrad Patent Licensee)

New Britain, Conn.

Southern Representatives

O. R. S. Pool,
Box 1375,
Greenville, S. C.

S. M. Smith,
P. O. Box 1423,
Greensboro, N. C.

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LARGEST YARN DYEING CAPACITY in the UNITED STATES

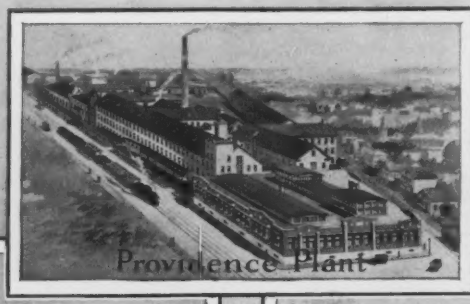
WE DYE:—

Cotton Yarns
for shirtings, voiles and dress goods

Merino Yarns

Worsted Yarn
on Jackspools

Fine Single Worsted Yarn



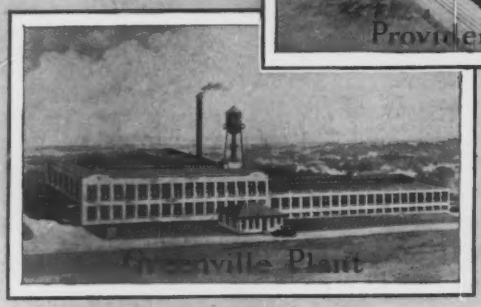
WE ALSO DYE:—

Hard Twisted Cords
for tire fabrics, fire hose and cable cords

Glazed Yarns

Silk Noils

Fine Splicing Cotton Yarn for hosiery



Job Dyers of Yarn in Wound Form

All Classes of Dyeing from Ordinary Direct Colors to the Best

We receive yarns on bobbins, tubes, cones or cops, dye it on Universal wound parallel tubes and return it to you, *without waste*, on these tubes or on cones.

We also receive worsted yarn on jackspools, dye it on our special perforated dyeing spools and return it to you on the original jackspools.

The Franklin Process eliminates skein and long chains, thus reducing yarn waste to a negligible quantity. This saving is particularly important in the dyeing of line count yarns. Here also we can probably save you considerable money in the cost of actual dyeing.

OUR YARN DEPARTMENT can afford you every facility for purchasing your gray yarn requirements through us if you so desire. This service saves you much bookkeeping and substantially reduces transportation costs.

IF YOU WISH TO DO YOUR OWN DYEING we are prepared to sell you Franklin Dyeing Machines.

FRANKLIN PROCESS CO.

Philadelphia PROVIDENCE Manchester, Eng.

New York Office, 72 Leonard Street

SOUTHERN FRANKLIN PROCESS CO.

Greenville, S. C.

That Cloth You are Making at High Cost on Common Looms

Could probably be made on Northrop Automatic Looms with large reduction of weaving costs. Perhaps your rival has made the change—or is about to do so.

Let's talk it over. You can't afford not to know. Our Salesmen and Experts are at your service.

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

SOUTHERN OFFICE ATLANTA GEORGIA

Copyright 1917 by Draper Corporation

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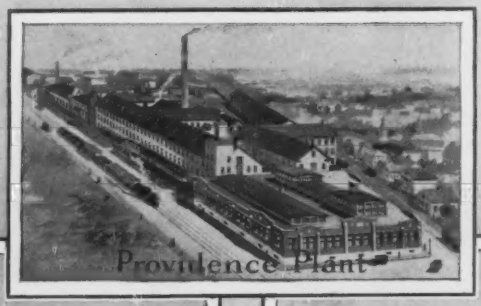

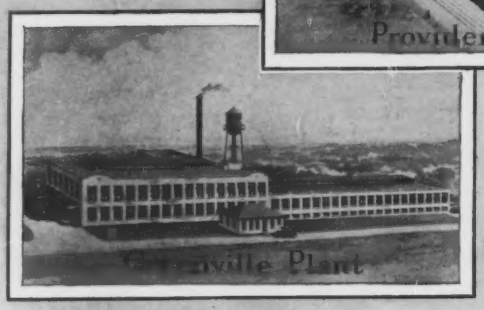

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SOUTHERN OFFICE ATLANTA GEORGIA

Copyright 1917 by Draper Corporation

"Smith-Furbush" Textile Machinery and "Proctor" Drying Machinery are now produced under the same roof—

The Smith & Furbush Machine Company, Philadelphia, has been consolidated with Proctor & Schwartz, Inc., of the same city. The combined organizations have taken the latter name.

Both companies have long been recognized as leaders in their line—the one, builders of Carding, Felting, Garnett, Waste and Shoddy Machinery since 1812; the other, builders of Drying Machinery for all materials since 1883.

The merging of these two old organizations means the welding together of vast individual experience and facilities, equipping them for better service than ever before.

The plant of the new organization, recently enlarged to 223,000 square feet of floor space, represents the last word in modern factory construction, equipment and operation.

PROCTOR & SCHWARTZ, INC.

Formerly

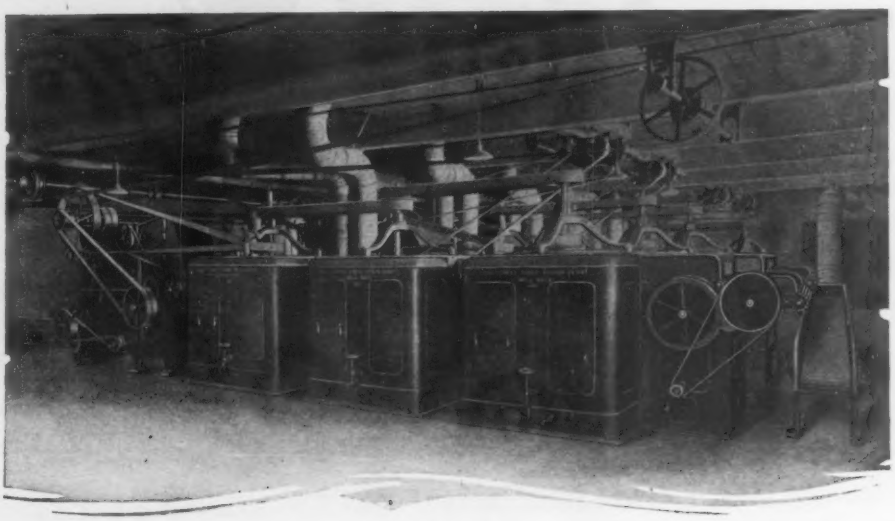
THE PHILADELPHIA TEXTILE MACHINERY COMPANY
SMITH & FURBUSH MACHINE COMPANY

PHILADELPHIA, PA.

Five Acres of Daylight Factory Floor Space

Seventh Street and Tabor Road, Philadelphia, Pa.

SKF



Ball-Bearing Equipped Openers

Run Cool in Day and Night Service

WITH step thrust bearings on the vertical spindles of openers excessive heating and wear were inevitable with the result that considerable productive time was lost in cooling hot bearings and in making adjustments and replacements.

The practical solution of the problem came with the application of SKF self-aligning thrust and radial ball bearings to this service.

Operating practically frictionless even under conditions of misalignment and not depending for their performance upon the maintenance of a load-carrying oil film, self-aligning ball bearings run cool and show no appreciable wear after years of service. The boxes remain clean and the lubricant cannot escape, oil being required only at infrequent intervals.

Eliminate needless production losses due to bearing troubles by equipping your machines with ball bearings. Our engineers will gladly co-operate in solving your particular problem.

THE SKAYEF BALL BEARING COMPANY

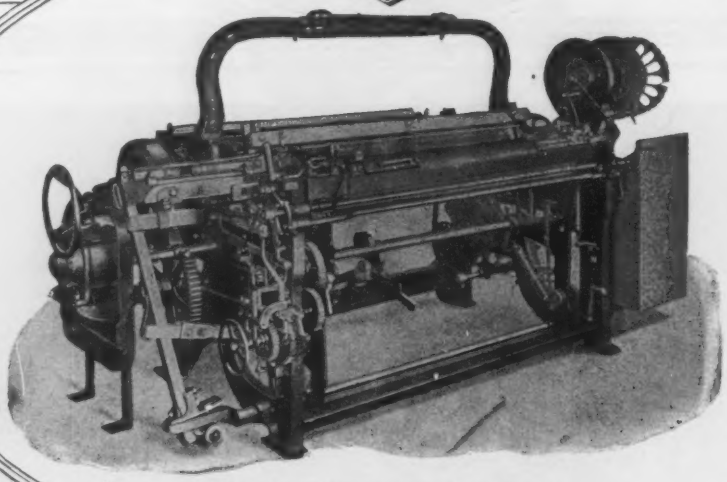
Supervised by SKF INDUSTRIES, INC., 165 Broadway, New York City

941

Normal View *Deflected View*

BALL BEARINGS

The Highest Expression of the Bearing Principle



Stafford bobbin-changing plain goods loom.

Stafford Looms Increase Production

We manufacture a complete line of automatic looms, both shuttle and bobbin-changing for weaving practically every type of fabric that can be made with a single shuttle. ¶ Stafford shuttle-changing looms will handle cop filling just as successfully as bobbin filling. We have a loom for every kind of yarn, coarse or fine, and for practically every variety of fabric, plain or fancy.

THE STAFFORD COMPANY
WEAVING MACHINERY
READVILLE, MASS.

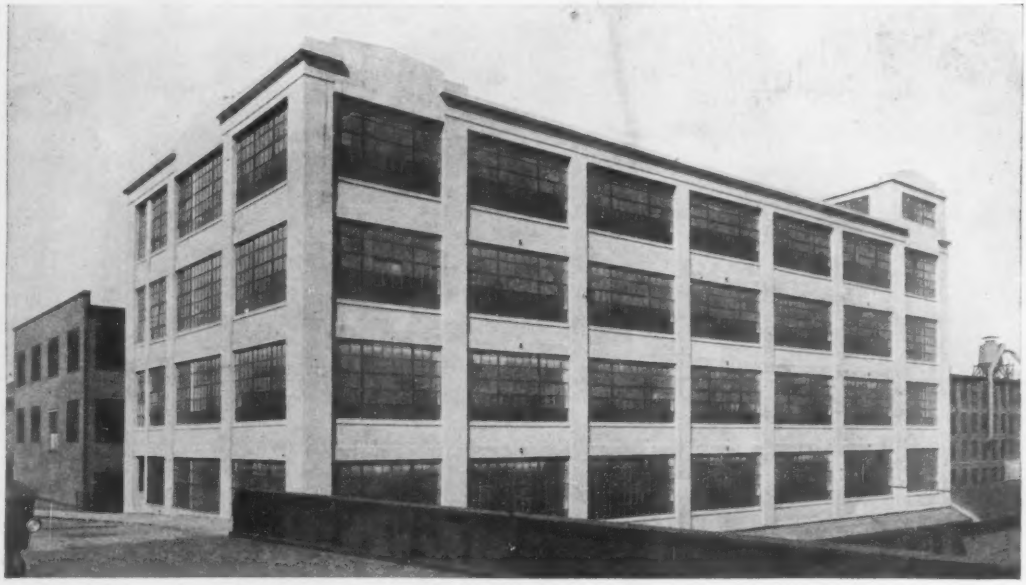
Branch Office
502 Colt Building
Paterson, N. J.

Southern Agent
J. H. Mayes
Charlotte, N. C.

Canadian Representative
Whitehead, Emmans, Limited
Montreal

AUTOMATIC STAFFORD LOOMS

Daylight for Textile Plants



Crompton & Knowles Loom Works, Worcester, Mass.
Erected by Aberthaw Construction Company, Daylighted by Truscon Steel Windows.

Nowhere is daylight a more important factor than in the textile industry. Light and ventilation were provided for the building illustrated above by the use of Truscon Steel Windows.

These fireproof, attractive steel windows represent the highest type of steel craftsmanship both in design and workmanship. They are easily operated, economical, and provide the maximum of light and ventilation. Adaptable for any building, large or small; made in various types to suit every requirement. Ask our daylight engineers for suggestions and estimates.

Truscon Steel Company

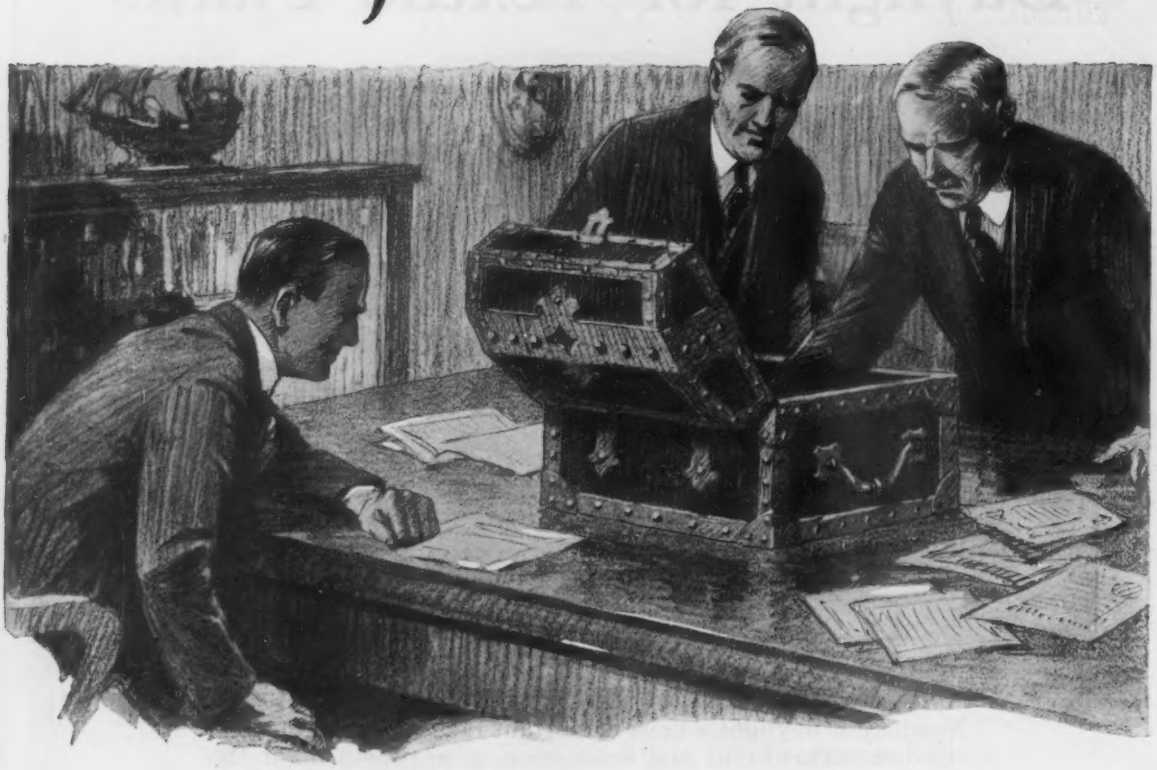
Youngstown, Ohio

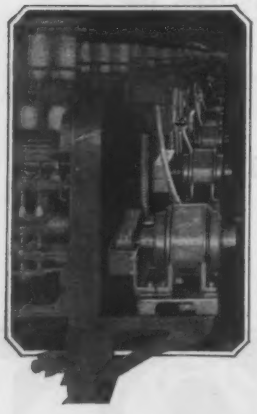
Warehouses and Sales Offices from Pacific to Atlantic.
For addresses see phone books of principal cities.
Canada: Walkerville, Ont. Export Div.: New York.

TRUSCON STEEL WINDOWS

TRUSCON STEEL CO.

When You Look for the





Look sharp for Power Slippage!

There's a Money Eater and a Profit Thief!

Power Slippage—loss inexcusable.

Whenever a belt slips, profits slip. The loss will not break you, but why permit the loss at all?

Figure your *yearly loss* if you can prove a *daily loss* in your belt-equipped plant.

If you are now using belting where you need a positive drive, study the evidence we have gathered from many plants in every line of manufacture. You will find it both interesting aud valuable.

1230

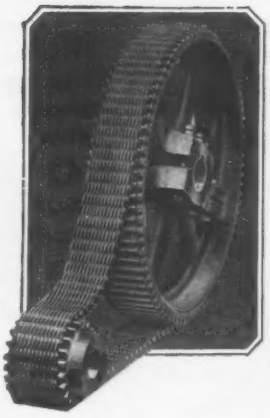
LINK-BELT

Leaks in the Profits Chest

A Link-Belt Engineer—*invited* to your plant—can quickly show you just what can be secured from the efficient transmission of power.

The Link-Belt Silent Chain Drive is "flexible as a belt—positive as a gear—more efficient than either." It can drive every kind of machinery and line shafting from ¼ horsepower to 1000 horsepower and over.

Learn more about this effective, quiet Drive. Send for our 144-page Link-Belt Silent Chain Price List Data Book No. 125.



LINK-BELT COMPANY

PHILADELPHIA	CHICAGO	INDIANAPOLIS
New York.....Woolworth Bldg.	Cleveland.....420 Kirby Bldg.	Denver.....Lindroth, Shubart & Co., Boston Bldg.
Boston 9.....49 Federal St.	Detroit.....2210 Woodward Ave.	Louisville, Ky.....Frederick Wahle, Starks Bldg.
Pittsburgh.....325 Fifth Ave.	Kansas City, Mo. 308 Elmhurst Bldg.	New Orleans.....C. O. Hine, 806 Carondelet Bldg.
St. Louis...Central National Bank Bldg.	Seattle.....820 First Ave., S.	Birmingham, Ala. S.L. Murrow, 720 Brown-Marx Bldg.
Buffalo.....547 Ellicott Square	Portland, Ore.....101 First St.	Charlotte, N. C.....J. S. Cothran, Com'l Bank Bldg.
Wilkes-Barre...2nd National Bank Bldg.	San Francisco.....100 Second St.	Canadian Link-Belt Co., Ltd.
Huntington, W. Va. Robson-Prichard Bldg.	Los Angeles. 163 N. Los Angeles St.	Toronto and Montreal
H. W. CALDWELL & SON CO., CHICAGO	NEW YORK, Woolworth Bldg.	DALLAS TEXAS, 709 Main St.

1230

SILENT CHAIN

"DOT" LUBRICATION
For Textile Machinery
Has Come to Stay

THOROUGH lubrication continually challenges the ingenuity of every shop manager. Evenwhere special men are employed as oilers to relieve the machine operators of this responsibility and trouble, the problem of inadequate lubrication is still present. It makes no difference how much lubricant is put into the cups, or how frequently they are filled, if the channel is clogged so that none of it reaches the bearings.

Realizing that the lack of positive lubrication is the cause of most machine repair expense, loss of time and increased overhead, engineers and shop managers have recently come to consider for industrial use the "forced" or "pressure" systems of lubrication as they are now used on automobiles. Experiments with the Pressure System produced such highly satisfactory results for the lubrication troubles in the plant making the tests almost entirely disappeared.

From here the pressure system has been developed until we can safely say that "Dot" pressure lubrication for industrial use has come to stay.

The New Improved "Dot" High Pressure Lubricator

Engineers who have made careful comparisons consider the "Dot" by all odds the sturdiest, handiest, most practical and most powerful high pressure lubricating system made. Today it is the standard lubricating system in more than 100 leading industrial plants, and is being used successfully on silk looms, textile machinery, lathes, grinders, slotters, headers, pointers, cranes, hoists, and on many other types of machines.

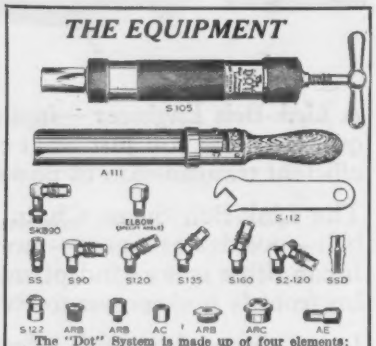
Write today for the booklet entitled "What Made This Bearing Freeze Up?" This booklet describes the use of the "Dot" system for all classes of industrial machinery.

Distributed in the South by

Hopkins Auto Equipment Company
397 Peachtree St., - Atlanta, Ga.

The "Dot" system is made only by the

THE EQUIPMENT



The "Dot" System is made up of four elements: the Gun, the Filler for the Gun, the Nipples, and the Dust Caps for the Nipples.

THE GUN is sturdily constructed, with a solid hardened steel nozzle that will withstand any amount of rough treatment. It insures a tight connection between the nipple and nozzle which prevents all leakage and seepage. It is designed for use with one hand and gives **three thousand pounds pressure.** It permits the use of oil as well as grease.

THE FILLER makes for convenience, speed and cleanliness of filling, and insures a solidly filled gun.

THE NIPPLES are designed to make every point of lubrication easily accessible. They are made of steel and have ball check valves with springs strong enough to prevent leakage and to make them dust tight.

CARR FASTENER COMPANY

Factory and General Offices: 31 Ames St., Cambridge, Mass.

BRANCHES:
Detroit New York San Francisco Toronto England

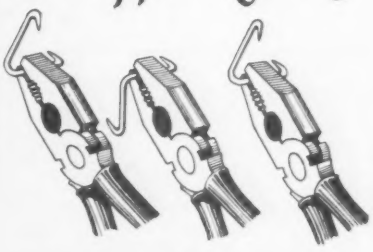
The Mechanical Accuracy of Clipper Belt Lacing assures a flawlessly Laced belt

STANDARD EQUIPMENT
THE WORLD OVER

Anyone can lace a belt with the

Clipper

The Plier Test of Clipper Quality



Take a pair of pliers and bend a Clipper hook back and forth. Note its toughness and fatigue resisting quality. How it bends and bends without breaking.

And yet, notice the "feel" of stiffness and strength. The quality of the Clipper hook coupled with the mechanical accuracy of the Clipper joint, have made the Clipper Belt Lacer standard equipment the world over.

Clipper Belt Hooks are carded 37 hooks to a card (enough for a six-inch belt) and packed 27 cards to a box with 14 Clipper Twisted Raw hide pins. This is enough to lace both ends of 80 inches of belting width.

Clipper Belt Lacer Company

Grand Rapids, Mich.

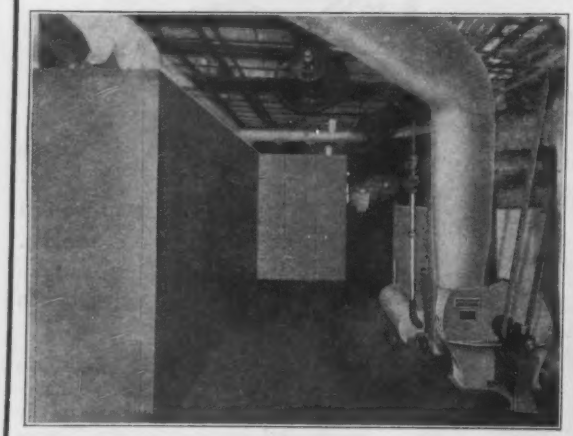
CLIPPER BELT LACER CO.
GRAND RAPIDS, MICH.

- ☐ Please send Clipper Belt Lacer on 30 days trial.
- ☐ Please have salesman call and demonstrate Clipper Belt Lacer.
- ☐ Please send full information regarding Clipper Belt Lacer.

Name _____

Address _____

Knowledge



The W. L. Fleisher Co. has installed hundreds of air-conditioning systems in various industries, all over the country.

Many complex problems presented themselves, such as location, product, methods of manufacture, and economy of installation and operation.

This broad knowledge, combined with that of the B. F. Sturtevant Co. is responsible for the unqualified success of every system designed and installed by Fleisher engineers.

Before recommendations are made, your precise requirements are carefully studied and analyzed so that the resultant air-conditioning system will accomplish exactly what you desire, with the highest efficiency and economy.

There is no obligation incurred in asking our engineers to call and look over your plant.

SALES OFFICES

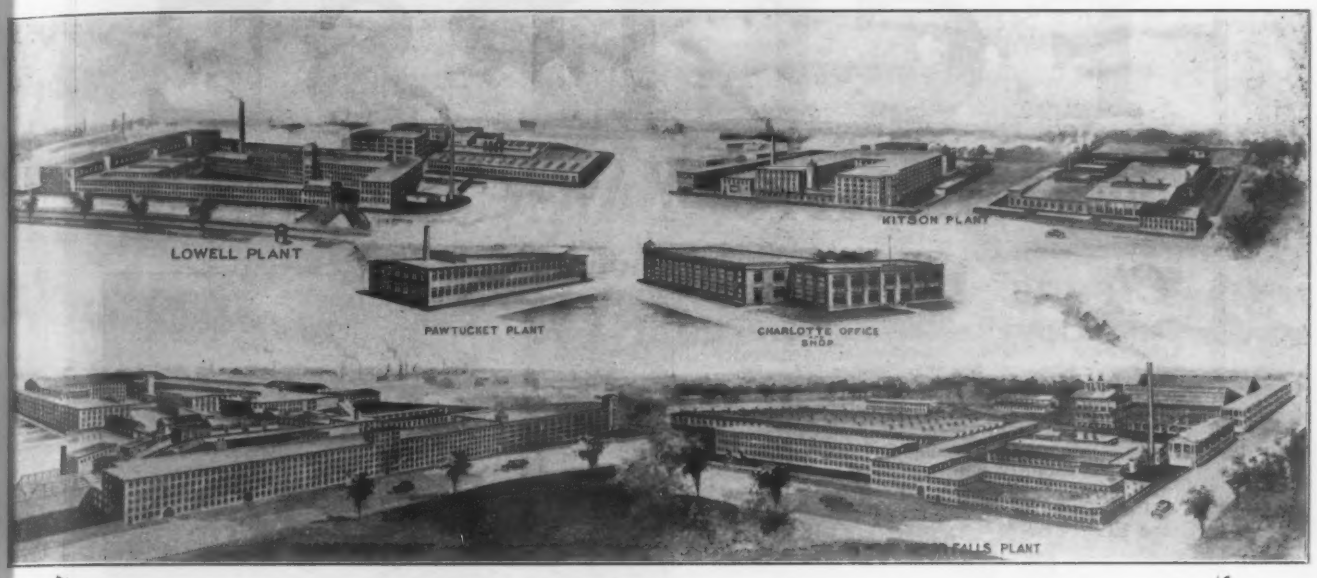
Atlanta	Detroit	Portland
Boston	Hartford	Rochester
Buffalo	Los Angeles	St. Louis
Chicago	Minneapolis	Salt Lake City
Cincinnati	New York	San Francisco
Cleveland	Philadelphia	Seattle
Dallas	Pittsburgh	Washington

Sturtevant
PUTS AIR TO WORK
HYDE PARK, BOSTON, MASS.

W. L. FLEISHER & CO., Inc.
31 Union Square West
NEW YORK, N. Y.

726

Saco-Lowell Service



BULLETIN NO. 6

Our New Charlotte Office and Shop

We are pleased to call your attention to the sixth plant in the above group. This plant is located on South Mint and Commerce Streets, Charlotte, N. C. This plant is the beginning of many plans for improving our service to Southern mills, and from time to time we expect to advise you as these plans mature.

At this date we are glad to advise you that with double equipment in a modern, well lighted shop building, we are prepared to rewind twice as many Lickers-in and reclothe twice as many card flats as heretofore. In this class of repair work for all makes of revolving flat cards, our workmanship and service cannot be excelled.

We shall be pleased at all times to have representatives of Southern mills inspect our new plant and offices, when in Charlotte.

To those of you who are not sending us your flats and lickers-in, we shall be pleased to quote our prices for this class of work.

TRY THIS SERVICE

Saco-Lowell Shops

CHARLOTTE, N. C.

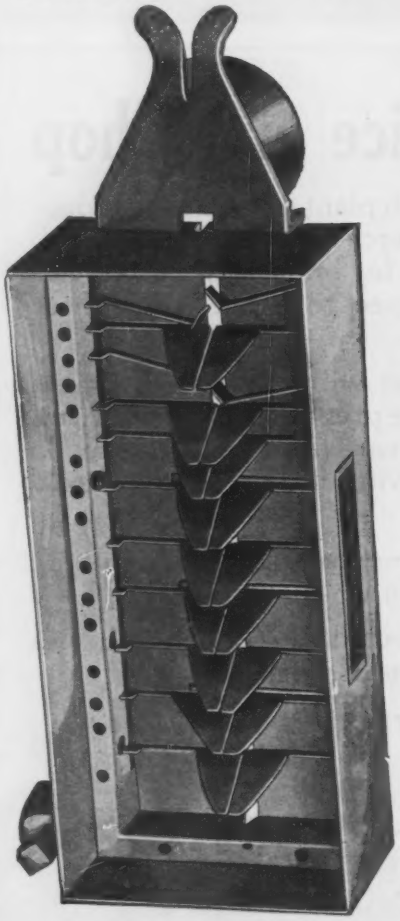
THE ECLIPSE AUTOMATIC YARN CLEANER

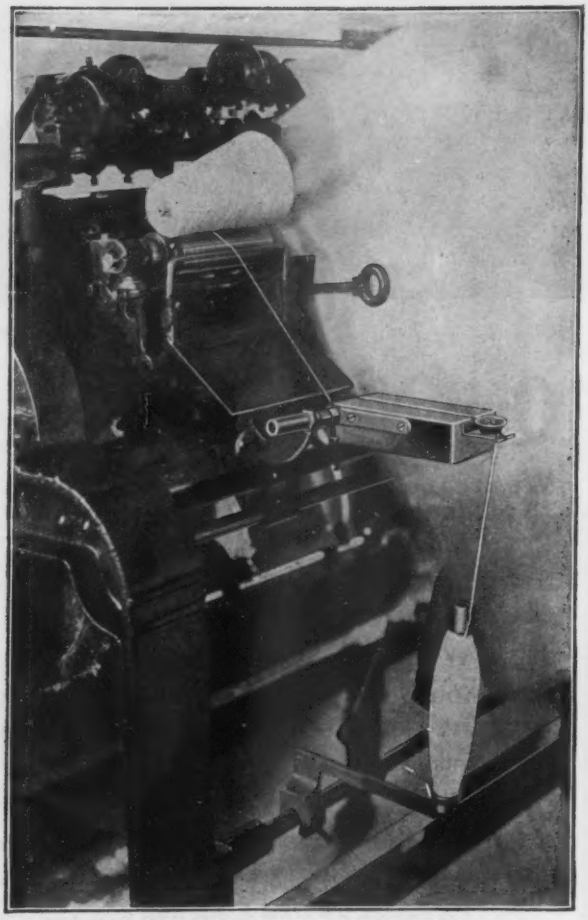
Cleans the Yarn

The ECLIPSE Automatic Yarn Cleaner cleans the yarn **clean**; automatically removes dirt, sand, slugs, bunches and all foreign matter. Threads instantly and easily.

The ECLIPSE Automatic Yarn Cleaner involves a new principle, tried and proven, whereby the yarn is cleaned by flexible blades which constantly vibrate.

It is proving highly satisfactory in mills all over the country. Have you investigated the ECLIPSE?



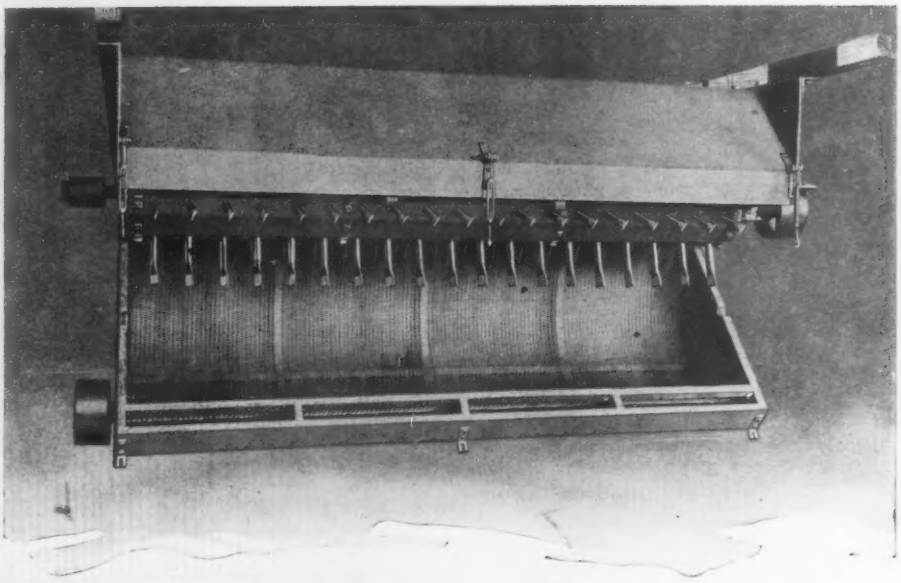


Let us have your inquiry for full details. When writing, state make of spooler or winder.

ECLIPSE TEXTILE DEVICES, INC.

ELMIRA, N. Y.

Makers of
Automatic Yarn Cleaner
Automatic Stop Motion
Yarn Tension Device



Opens 25,000 Pounds of Cotton
Per Ten-Hour Day

In this day of high production costs, space and equipment must be saved—labor must be conserved—utmost efficiency must be maintained.

The MURRAY Cotton Cleaning and Aerating Machine is revolutionizing the opening of cotton. The MURRAY takes care of itself. It has a working capacity of 25,000 pounds of cotton per ten-hour day—the greatest capacity of any cleaning and opening machine on the market today. This means a great economy in time and labor.

The MURRAY Cotton Cleaning and Aerating Machine can be set into the cotton suction pipe between the opening room and breaker pickers, and hung from ceiling or other convenient support, thus eliminating expensive special connecting arrangements.

It has no hidden bearings that can't be seen or given attention while operating. Every bearing is in plain sight and can be reached without interfering with operation or stopping machine.

Either belt or motor drive.

These are only a few of the many advantages of the MURRAY.

We want to tell you more. Write us for the full and complete story.

No Obligation for MURRAY service.

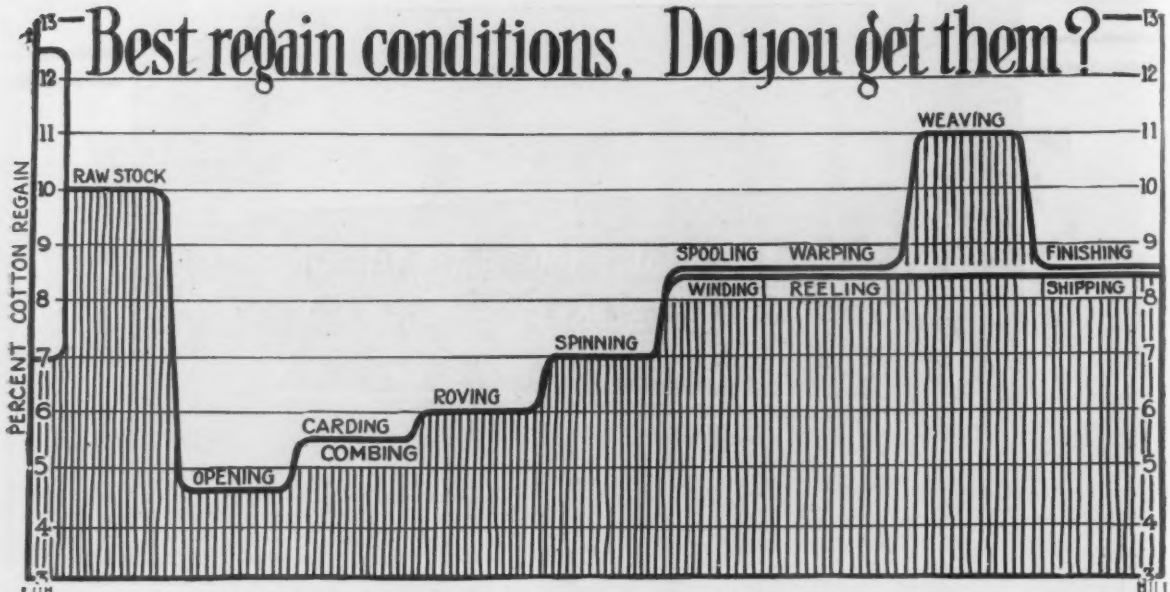
THE MURRAY COMPANY
ATLANTA, GA.

COTTON WELL OPENED IS HALF SPUN

The Murray

(PAT. PENDING)

COTTON CLEANING AND AERATING MACHINE



Thirsty Cotton—The Reason—The Cost

Look at one tiny fibre of cotton through a miscroscope—and see how much it resembles a stalk of sugar cane.

Fibre of such a nature is extremely susceptible to moisture—but change it rapidly from dry to moist and back again and its elasticity is impaired, maybe destroyed.

Manufacturing cotton is really a drying process. Speed generates heat and heat dries. Everyone of those tiny little stalks when dried sends out a protest—a warning. They tend to curl and twist.

Humidifiers were installed originally to prevent this. But ParkSpray humidifiers with automatic regulation have greater possibilities.

Suppose your terminal regain is down to 4 percent—a condition we find in many humidified plants. Remember your cotton came 7 to 12 percent moist; that 8¼ percent is standard; that you pay the difference. Let us figure what you lose.

With cotton at

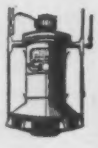
15c you lose $3.08 on each bale
20c " " 4.12 " " "
25c " " 5.16 " " "

These losses are figured at the prime cost of raw material—not at selling price of product. They consider only raw material shrink. They do not take into account all the other manufacturing losses and perplexities that result when every little tiny stalk protests with an individual curl of its own.

There is just the right amount of moisture needed for each manufacturing operation in your mill. It may not be the same as your neighbor's. It may not be the same as in another room—on the same operation in the same plant.

There is a right way to determine what this is. Inadequate humidifier equipment is the most expensive purchase you can make at any price. We would rather install the right equipment at a fair price than hit or miss equipment at any price.

If you buy 4 percent equipment, a month or two of thirsty cotton kicks all you have saved out the shipping room door.



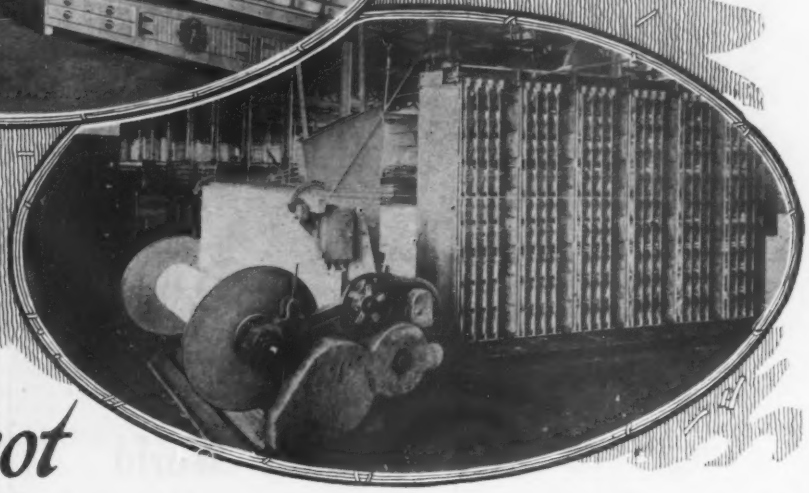
Parks-Cramer Company

Engineers & Contractors

Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte

Copyright 1922 P. C. Co.



A Series
Number 1.

The Perfect Weavers Knot

There has long been a demand for a machine that would tie a true weaver's knot. The round knot commonly used is simple to tie either by hand or machine but is always a source of more or less trouble in weaving.

The weavers knot tied by the Knotter on the new Barber-Colman Automatic Spooler is less bulky and has less tendency to slip. In passing through all the processes that follow spooling it causes less trouble than any other kind of knot and results in a better product and greater production at less cost. A warp made from yarn with this knot is the most perfect possible.

WEAVERS KNOT

FULL DATA SENT ON REQUEST

BARBER-COLMAN COMPANY
ROCKFORD, ILL.
BOSTON, MASS. GREENVILLE, S. C.

BARBER-COLMAN SYSTEM
OF
SPOOLING
AND
WARPING

AUTOMATIC SPOOLER *with* WEAVERS KNOTTER

HIGH SPEED WARPER

Engraved On The Textile World As A Synonym For Quality

With an immense plant employing the most up-to-date equipment and expert workmen every minute to build real lasting quality into loom harness and reeds—with an organization national in its scope and holding a reputation for its broad interpretation of what is due the consumers of its product—is it any wonder that the name "Emmons" has left its mark on the textile world as a synonym for quality products?

If there are any textile mills in the world who are not using these quality products of the world's largest manufacturers of loom harness and reeds, we ask only an opportunity of proving "Emmons" superiority and the service and satisfaction that goes with every order, large or small.

Write "Emmons" on your next order. Write us for prices.

EMMONS LOOM HARNESS CO., LAWRENCE, MASS.

Largest Manufacturers of Loom Harness and Reeds in America

SOUTHERN REPRESENTATIVE: GEO. F. BAHAN.

EMMONS
LOOM HARNESS AND REEDS

Come South, Mr. Spinner, Come South!

Why has seventy per cent of the spinning equipment installed in the last twenty years gone ***into the South?*** For just one reason:

"Cotton goods can be manufactured today to better advantage in the South than they can in the North."

From an address by Kenneth Moller at conference of Lockwood, Greene & Co., and associated industries, Boston, Feb. 28 to March 3.

The South's Impressive Advantages

(Stated by Mr. Moller)

LOWER COST OF PRODUCTION
LOWER COST OF MATERIAL
LOWER TAXES
BETTER LABOR CONDITIONS
BETTER FREIGHT RATES
BETTER LABOR LEGISLATION

Shown in This Concrete Example

Mr. Moller's estimated cost of production of a certain class of standard cotton goods:

Northern Mill	*Southern Mill*
60.3c per lb.	**52.7c per lb.**

"A difference," says Mr. Moller, "of 7.6c per pound or 14% . . . This difference, therefore, would amount to **$3.80 per spindle per year.**"

This $3.80 in favor of the southern mill represents the difference between profit**able operation** and operation attended by harrassing handicaps and difficulties. In brief, locating a cotton mill in the South is, to a large degree, equivalent to underwriting its success.

In the case of a 50,000 spindle mill, this $3.80 represents an annual earning of $190,000 by the mill located in the South over that earned by a mill of the same capacity located in the North.

And it is equivalent to a dividend of 6.3% on $3 000,000, the estimated cost of the construction and equipment of a 50,000-spindle mill, North or South, on the basis of $60.00 per spindle.

Spinners looking toward the South are invited to call on this company for any information they desire.

Alabama Power Company

BIRMINGHAM, ALABAMA

Tennessee-The Hear

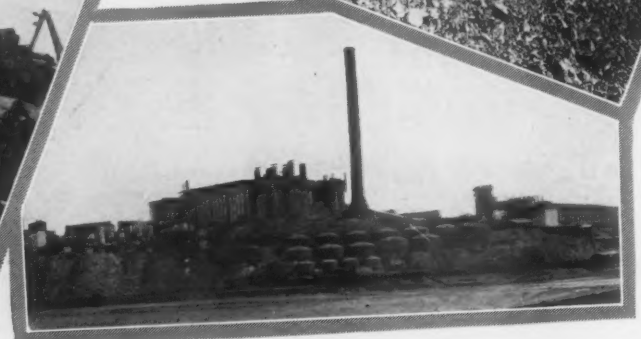
7,000,000 Tons of coal mined Yearly. 25,000,000,000 Tons in the Ground.

Cotton Field in Tennessee

$1,000,000 worth of iron mined yearly. Half-billion tons in reserve.

Limestone is the most abundant rock in the state. Annual output of Tennessee's cement mills valued at over $2,530,000.

The forests of Tennessee include 140 species of trees. Over One Billion Board feet of lumber cut yearly.



Tennessee produces more copper than all states east of Rocky Mountains except Michigan.

The Tennessee Ele

art of Industrial America

Raw Materials In Abundance

AT THE MANUFACTURER'S DOOR

Within the boundaries of Tennessee there is an unlimited supply of raw materials of all kinds, the development of which offers an inviting field for the investment of capital. Located in the heart of the cotton growing section, raw cotton is right at the manufacturer's door. In addition other raw products are here in abundance. In the eastern section of the state, for example, are large deposits of limestone, clays, shales, granite, slate, marble, bauxite, zinc and copper bearing ores. In Middle Tennessee there are extensive phosphate beds. Manganese, lead and iron are also found in quantities and there is a sufficient supply of coal beneath the surface of the ground to take care of the entire needs of the state and for export.

Close proximity to these sources of supply—a factor that gives Tennessee's plants a marked advantage over competitors in other parts of the country—has resulted in the building up during recent years of an extensive textile industry together with the establishment of a most diversified line of manufacturing. The industrial growth of the State during the past two decades has been truly remarkable, the value of manufactured products having increased 500 per cent during this period.

With additional advantages in the way of amply developed water power supplemented by adequate steam reserve plants, a stable and intelligent supply of native labor, unexcelled rail and water transportation facilities and healthful year round climate, Tennessee—the heart of Industrial America—offers to the textile industry peculiarly ideal inducements for the location of new plants and branch units.

FIVE ADVANTAGES IN TENNESSEE

1. Ideal climate the entire year.
2. Raw materials of all kinds in abundance.
3. Market facilities — unsurpassed rail and water transportation.
4. Ample supply of intelligent and stable labor.
5. Continuous and reliable electric power at low cost.

Information gladly furnished interested manufacturers relative to power, power costs and available industrial sites.

THE TENNESSEE ELECTRIC POWER CO.

CHATTANOOGA, TENN.

lectric Power Co~

A 1200 ACRE TEXTILE CITY

THE development of 1200 acres of rolling land into a complete textile city for the Dixie Spinning Mills at Chattanooga presented quite an interesting problem. To solve the problems, Robert & Company, Inc., were engaged to handle the entire development of 160,000 spindles, consisting of four units of 40,000 spindles, each to manufacture one special number. Number 1 mill is shown under construction in the airplane view above.

In carrying forward the work on this initial unit, every feature of ultimate development was carefully studied and all phases of the development worked out with a clear vision of future requirements so as to merge into a final development that would function harmoniously and operate profitably and economically. Various schemes were worked out before final plans were decided upon for village layouts, water and sewage systems, fire protection, street locations, design and placing of buildings, warehouses, opening room, waste house, boiler house, machine shop, etc.

Architectural, engineering and power experts, each specializing in his particular field, assure our clients of not only the most efficient solution of any problem entrusted to us, but a real money-saving not only in initial investment but in permanent satisfaction and dividend-paying economy.

May we solve YOUR problems for you?

ROBERT & COMPANY

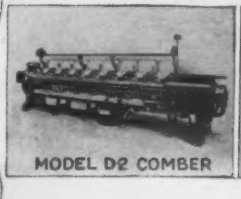
ARCHITECTS AND ENGINEERS INCORPORATED ATLANTA, GA.

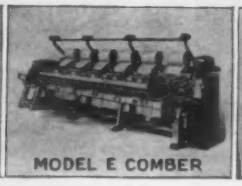
WHITIN MACHINE WORKS

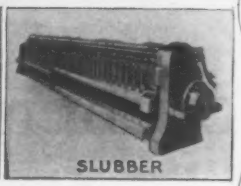
ESTABLISHED 1831

TEXTILE MACHINERY

MAIN OFFICE AND WORKS, WHITINSVILLE, MASS., U.S.A.







Manufacturers of

COMPLETE EQUIPMENTS

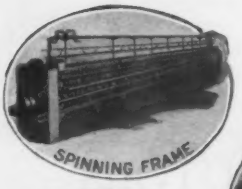
for Making

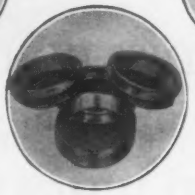
YARNS

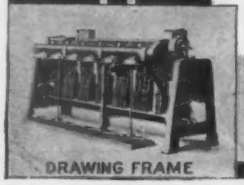
from

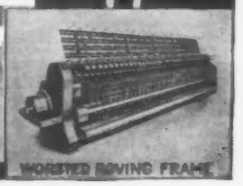
COTTON, COTTON WASTE, WOOL, ASBESTOS, ETC.

Descriptive Circulars on Request









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MANUFACTURING & COMMISSION CO.,

58-60 Worth Street New York City

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Fabrics for Home and Export

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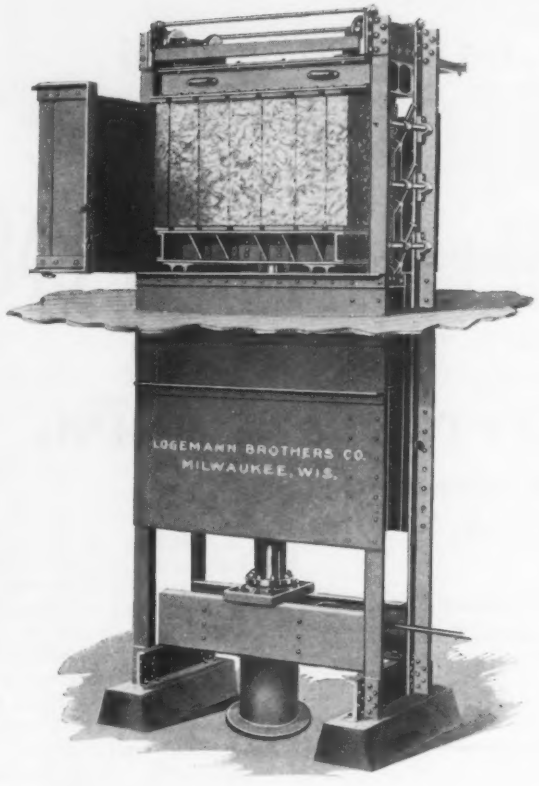
SOLE DISTRIBUTORS
to the
JOBBING AND WHOLESALE TRADE
for the
DURHAM HOSIERY MILLS

LOGEMANN

Hand-Belt-Electric-Hydraulic

Baling —— Presses



There Are
LOGEMANN BALERS
For All Purposes

In our line of more than eighty types and capacities will be found a machine to suit every conceivable purpose and condition from powerful hand-operated presses for baling clippings, to deep-box hydraulic machines for fluffy waste of all kinds.

Progressive mill operators are today adopting the LOGEMANN press as standard (*First*) Because of the quality of the workmanship, design and material; (*Second*) because of the stability of the company building these machines, and our reputation for speedy service on the comparatively rare occasions when repairs are needed.

A letter setting forth your baling problems will be appreciated.

LOGEMANN BROTHERS CO.

Main Office & Works - Milwaukee, Wis.

ANDERSON, CLAYTON & CO.

Cotton Merchants

Oklahoma City, Houston, Savannah, Atlanta
New Orleans, Birmingham,
Los Angeles

Boston, Providence, Fall River, North Adams
Charlotte, N. C.

ANDERSON, CLAYTON & FLEMING

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145 St. James Street
Montreal, Canada

Members:
New York Cotton Exchange
New Orleans Cotton Exchange

Associate Members:
Liverpool Cotton Association, Ltd.

THE FUN-FUL LINE

PLAYGROUND EQUIPMENT

349 Cotton Mills Using FUN-FUL!

A few of them

Pacific Mills—Columbia, S. C.
Columbia Mills—Columbia, S. C.
Wymojo Mills—Rockhill, S. C.
Woodside Mills—Greenville, S. C.
Pacolet Mills—Pacolet, S. C.
Drayton Mills—Spartanburg, S. C.
Monarch Mills—Union, S. C.
Langley Mills—Langley, S. C.
Grendel Mills—Greenwood, S. C.
Greenwood Mills—Greenwood, S. C.
Belton Mills—Belton, S. C.
Loray Mills—Gastonia, N. C.
Gray Mills—Gastonia, N. C.
Arlington Mills—Gastonia, N. C.
Flint Mills—Gastonia, N. C.
Cannon Mills—Kannapolis, N. C.
P. H. Hanes Mills—Winston-Salem, N. C.
Proximity Mills—Greensboro, N. C.
Durham Mills—Durham, N. C.
Roxboro Mills—Roxboro, N. C.
Tolar-Hart-Holt Mills—Fayetteville, N. C.
Hart Mills—Tarboro, N. C.
Pilot Mills—Raleigh, N. C.
Cardinal Mills—West Point, Miss.
Lauderdale Mills—Meridian, Miss.
Danville Mills—Danville, Va.
Schoolfield Mills—Schoolfield, Va.
Bonham Mills—Bonham, Texas.
Sherman Mills—Sherman, Texas.
Corsicana Mills—Corsicana, Texas.
Itasca Mills—Itasca, Texas.
Brazo Valley Mills—West, Texas.
Prendergast Mills—Prendergast, Tenn.
Davis Mills—Chattanooga, Tenn.
Avondale Mills—Birmingham, Ala.
Lanett Mills—Lanett, Ala.
Anniston Mills—Anniston, Ala.
Montgomery Mills—Montgomery, Ala.
Fulton Bag Mills—Atlanta, Georgia.
Exposition Mills—Atlanta, Georgia.
Calloway Mills—LaGrange, Georgia.
Moultrie Mills—Moultrie, Georgia.
Trion Mills—Trion, Georgia.
LaFayette Mills—LaFayette, Georgia.
Bibb Mills—Macon, Georgia.
International Mills—LaGrange, Georgia.

At the Brazilian Centennial Exhibition at Rio de Janeiro, Brazil, South America, which has just closed, HILL-STANDARD Equipment was awarded the gold medals.

Catalog on request

HILL-STANDARD CO.

Anderson, Our 22nd year Indiana

Let Us Add Your Name To This List

OUR service to textile mills is the result of years of experience in installing textile theatre equipment. Our representatives call upon the mills personally, lay out the plans, advise on the proper equipment required and finally supervise the installation and the starting of the theatre. In other words, they take the whole problem off your hands and do not turn over the work to you until the theatre is operating satisfactorily.

The textile industry is demanding the best moving pictures for their employees and that is why they regularly specify POWER'S PROJECTORS.

That is why more Power's Projectors are used by textile mills in the South than all other projectors combined.

We carry a complete line of supply parts and equipment at our various branches. Your orders for supply parts will be filled the same day the order is received. Whatever are your needs for your theatre, we can supply them.

We have a special offer for Textile Mills. May we present it to you?

Satisfied Users of POWER'S PROJECTORS

ALABAMA

W. A. Handley Mfg. Co. ..... Roanoke
Tallassee Mills ..... Tallassee
Fairfax Mill ..... Fairfax
Avon Mills ..... Sylacauga
Lanett Cotton Mills ..... Lanett
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Selma Mfg. Co. ..... Selma
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GEORGIA

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Roswell Mfg. Co. ..... Roswell
Gainesville Cotton Mill ..... Gainesville
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Pacolet Mfg. Co. ..... New Holland
Manchester Cotton Mills ..... Manchester
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Woodside Cotton Mills ..... Greenville
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Clifton Mfg. Co. ..... Clifton
D. E. Converse Co. ..... Glendale
Winnsboro Mills ..... Winnsboro
Monarch Mills ..... Lockhart
Republic Cotton Mills ..... Great Falls

Southern Theatre Equipment Company

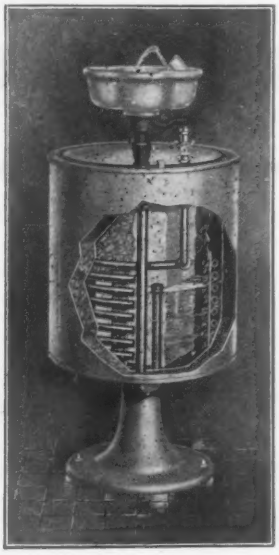
WILLIAM OLDKNOW, President.

100 Walton St.
ATLANTA, GEORGIA

THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

Eighteen Fifteen Main St.
DALLAS, TEXAS

Automatic Stream Control



Practical Drinking Mound

No. 570-A

The automatic control maintains a uniform height of stream—regardless of pressure

HALSEY TAYLOR Cooler Fountains are never out of order, or the stream low and unsanitary, when the line pressure is down.

Automatic control keeps the stream at uniform height and the patented two-stream projector converges two streams of water with a retarding action at the apex of the arc, forming a convenient drinking mound.

These are two of the reasons why HALSEY TAYLOR Fountains are recognized as more efficient by manufacturers everywhere.

More than a score of corporations have 100 or more HALSEY TAYLOR Fountains in daily use, and are constantly adding more.

Write today for new 32-page catalog of drinking fountain fixtures for factories, schools, public buildings, parks, playgrounds, etc.

The Halsey W. Taylor Company

No. 525 N. Park Ave., Warren, Ohio

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Philadelphia
5224 Greene Street

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Atlanta, Ga.
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Kansas City
202 Baltimore Bldg.

San Francisco
237 Rialto Bldg.
Denver
401 Jacobson Bldg.

HALSEY TAYLOR

—"without prejudice"

THERE ARE some bearings which can only be lubricated with oil. Some only with grease.

Then there are some which, apparently, may be lubricated with either—but the correct selection of the type of lubricant used may determine the operating efficiency.

Engineers and oil buyers have to face this question, and when they meet it they will do well to consult with a representative of The Texas Company.

He can advise without prejudice.

The Texas Company manufactures Texaco Lubricants in all useful forms.

Thus a general outline will include:

TEXACO STRAIGHT MINERAL OILS
TEXACO COMPOUNDED OILS
(containing fixed oils in correct proportions for the lubrication of Steam cylinders and for similar purposes)
TEXACO LIQUID GREASES
TEXACO SEMI-SOLID GREASES
TEXACO SOLID (HARD) GREASES

and

In a class by themselves:

TEXACO THUBAN COMPOUND
(a lubricant for light, fast running gears)
and
TEXACO CRATER COMPOUND
(a remarkable, pure, heavy, lubricant for heavy gearing, wire ropes, etc.)

We cite this with the thought in mind that though our readers may know that The Texas Company is a Complete Cycle (controlling every operation from the time a well is drilled until the refined product leaves our warehouses), they may not all be aware of the completeness of the line of Texaco Lubricants.

In other words, the statement:

"There is a
TEXACO LUBRICANT
For every Purpose"

is an actual fact.

And a fact of value to the user of oil, because Texaco can and does meet every lubricating requirement on any kind of machine or prime mover in every field of mechanical endeavor.

So when you have a problem of lubrication (and every engineer has them once in a while) put it up to Texaco and be advised without prejudice.

TEXACO

Engine Oil - Textile Mill Lubricants - Turbine Oil
Steam Cylinder Oil - Gear Lubricants - Greases

THE TEXAS COMPANY, U. S. A.
TEXACO Petroleum Products
Dept. O, 17 Battery Pl., New York City
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Offices in Principal Cities

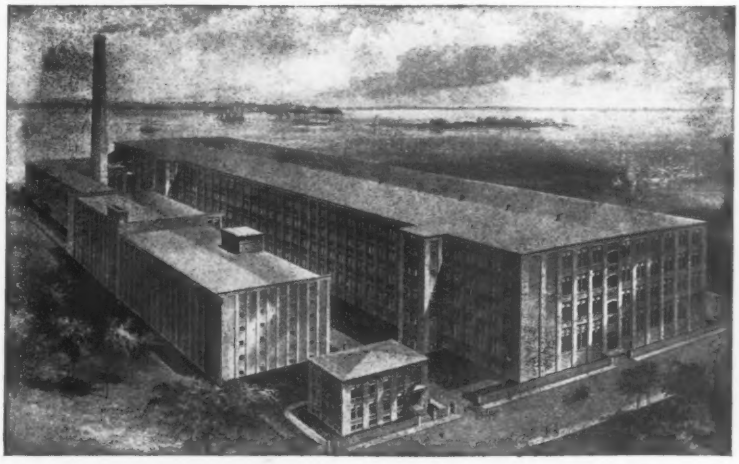
Quissett Mill

New Bedford, Mass.

WILLIAM M. BUTLER
President

EDWARD H. COOK
Treasurer

THOMAS F. GLENNON
Agent



COTTON YARNS

Our Carded and Combed Yarns are spun in all numbers and description.

Ply Yarns our Specialty

Egyptian—Sea Island—Peelers—Sakelarides

QUISSETT MEANS QUALITY

Ask Your Broker or Communicate Direct

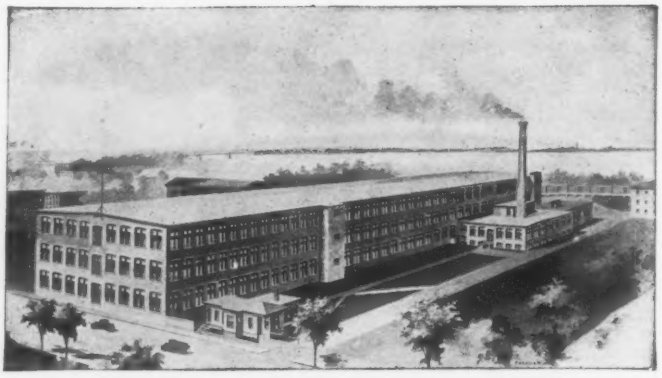
Nemasket Mill

Taunton, Mass.

WILLIAM M. BUTLER
President

EDWARD H. COOK
Treasurer

THOMAS F. GLENNON
Agent



Spinners and Doublers of High Grade Cotton Yarn from selected cotton, numbers from 20's to 80's single and double carded and combed, put up on tubes, ball warps, beams, bobbins and spools.

Ask Your Broker

Or Communicate With Above Officers Direct

The Deciding Factor of Paint Value

In the selection of paint for protection of houses, service records should always be the deciding factor in determining value.

On this basis it is not surprising that DEGRACO PAINTS are so widely used.

DEGRACO PAINTS stand up in service year after year—afford positive protection—eliminate frequent repaintings—factors of paint service which produce lowest per year cost.

Textile mills the country over pin their faith on DEGRACO PAINTS because they know through experience and test they can be used with definite assurance of service and satisfaction.

Use DEGRACO HOUSE PAINTS and eliminate the hazard of experiment.

DETROIT GRAPHITE COMPANY
555 Twelfth Street Detroit, U. S. A.

DEGRACO PAINTS
All Colors for All Purposes

DEGRACO PRODUCTS

- Superior Graphite Paint
- Sta-White
- Degraco House Paint and Varnish
- Degraco-Tone-*Flat wall finish*
- Degraco Brick and Concrete Paint
- Anti-Aqua-*Damp-proof coating*
- Degraco Gas Holder Paint
- Degracolin-*Concrete floor hardener*
- Degraco Enamels
- Industrial Finishes

DEGRACO PAINTS are sold through branch offices with warehouse stocks in all principal cities.
Manufactured in Canada by Dominion Paint Works, Limited, Walkerville, Canada

DEGRACO All Colors for All Purposes
PAINTS
VARNISHES
ENAMELS

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CHARLOTTE, N. C.
Charlotte Supply Co.

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J. Russell & Co.

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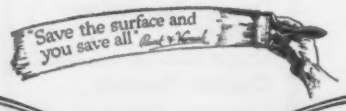
UTICA, N. Y.
American Hard Wall Plaster Co.

WOONSOCKET, R. I.
J. B. Farnum Co.



Shove Mills, Fall River, Mass.

Farsighted Economy

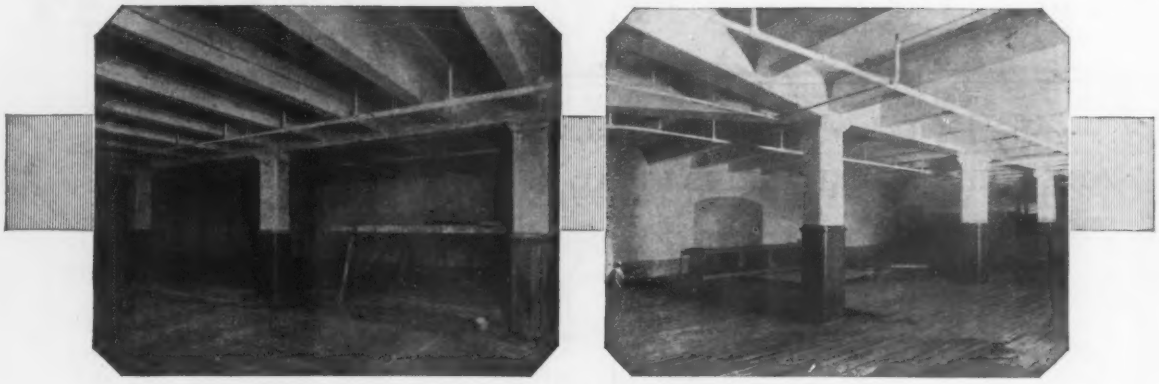
Throughout the Shove Mills—in the spacious carding rooms, spinning and weaving departments—farsighted economy is reflected from the finish of walls and ceilings.

The interior surfaces of these great textile mills are painted with OJACO Mill White so that the available light will be reflected rather than absorbed.

Eyestrain is lessened, vision is improved and fatigue reduced. Efficient, economical production is assured.

Upon request the nearest OJACO distributor will furnish details concerning the effectiveness of OJACO Mill White for all Textile Mill interiors

Oliver Johnson & Co., Inc.
Paint Makers since 1833
PROVIDENCE, R. I.



These two unretouched photographs show the remarkable difference made by the application of Surlight—the whitest mill-white made.

Pure White Paint that Stays White

Surlight is the whitest mill-white paint made. This is an actual fact that is open to demonstration—results will show that in every case, under similar conditions and service, Surlight is whiter when applied, whiter when dry and stays whiter longer than any paint or enamel you can buy.

The Surlight Book

This book should be in the hands of everyone interested in mill-white paint for textile use. Send for copy.

The ability of Surlight paint to *stay white* is responsible for many real savings. It makes every wall a light reflector—daylight is caught from all angles and diffused in soft, restful rays to workers' machines and benches. This naturally helps to increase production—in many cases as much as 8 to 12%. The light-reflecting properties of Surlight tend to reduce spoilage and this is an important factor in reduction of losses in both labor and material.

The factory interior brightened with pure white Surlight paint provides a cheerful, sanitary atmosphere—it helps to lighten corners and areas that were formerly dark and removes the temptation to allow dirt and rubbish to accumulate.

Surlight paint lasts long and eliminates the necessity of frequent repainting. It forms a tough defensive coat that dries to a smooth, hard non-porous surface, which will not collect dust, dirt or flying particles. It will not peel, check, crack, flake or fall off.

Get This Interesting Book

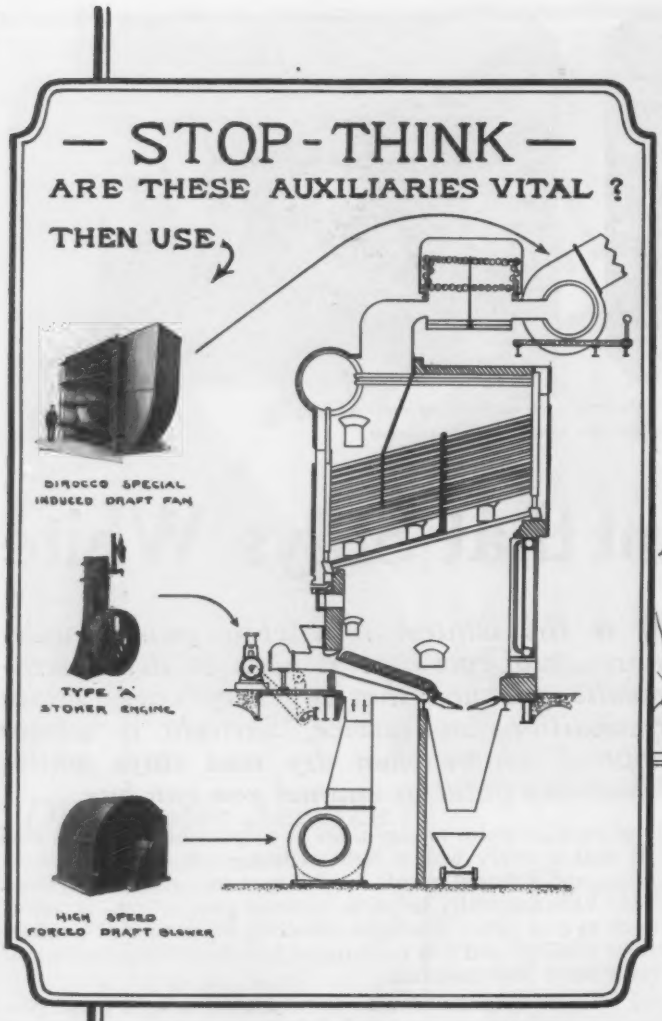
We have prepared a very interesting book on the subject of Surlight paint—what it is, what it does and various considerations of the effects that follow its use. Send for this book—it will be mailed gratis on request.

ST. LOUIS SURFACER & PAINT CO.

4211 Arlington Ave. **St. Louis, Mo.**

SURLIGHT

The Light Reflecting Wall Paint for Industrial Purposes


— STOP-THINK —
ARE THESE AUXILIARIES VITAL ?
THEN USE
SIROCCO SPECIAL INDUCED DRAFT FAN
TYPE "A" STOKER ENGINE
HIGH SPEED FORCED DRAFT BLOWER

Vital Factors in Mechanical Draft Systems

In the application of mechanical draft apparatus, the proper selection of the blowing equipment to meet the individual demands of the plant it serves, is second only to operating reliability. Control of capacity, pressure and speed, method of drive, economy of operation, etc., are a few of the factors which must be considered.

The wide use of American Blower mechanical draft apparatus is due largely to the fact that there is American Blower equipment of rugged design and maximum efficiency for every requirement. This, with definite and accurate knowledge of its performance, enables American Blower engineers to cooperate with you in the efficient solution of any problem involved in mechanical draft installations.

Bulletins describing American Blower equipment, its mechanical superiority, and its application, will be sent you on request.

AMERICAN BLOWER COMPANY, DETROIT
BRANCH OFFICES IN ALL PRINCIPAL CITIES
CANADIAN SIROCCO COMPANY, LIMITED, WINDSOR, ONTARIO (273)

American Blower

"Sirocco" TRADE MARK

EXHAUSTERS · VENTILATING FANS · AIR WASHERS · BLOWERS · ENGINES
FOR HEATING, VENTILATING, DRYING, AIR CONDITIONING, MECHANICAL DRAFT

PERMANENT WATERPROOFING

A series of articles by the Technical Staff of the Richardson Research Laboratories, showing what modern science has done to perfect the materials and methods of waterproofing construction

No. 2. The physical requirements of a perfect waterproofing bitumen

The one quality above all others you demand of waterproofing is *permanence*. For you don't want an otherwise flawless building damaged because the roof, for example, breaks down under the weather.

Every modern structure, as you know, requires a certain amount of flexibility in each part, so as to care for strains and stresses due to wind pressure, ground movement, unusual loads, seasoning. Especially important is this flexibility in the waterproofing bitumen used.

Up to the present time, however, much damage has been done to otherwise excellent structures because the waterproofing cracked and broke down under strain. To overcome this defect, the Richardson Research Laboratories, after years of laborious investigation, have at last produced a waterproofing bitumen which in spite of strain is actually flexible and permanent.

This new product, Viskalt, was blended to meet the two basic requirements which together constitute the Law of Permanent Waterproofing:

1. **There must be applied between the structure and the source of water a continuous, unbroken layer absolutely impervious to water.**
2. **This unbroken layer must be held in place permanently.**

In order to keep the waterproofing layer continuous and unbroken even under stress, it was necessary to combine properly from the highest grade raw materials the actual chemical ingredients of the bitumen.

Pliant under stress

As a result of this method, Viskalt, even through a remarkably wide variety of above grade and below grade uses, remains constantly pliant under stress. By comparing Viskalt with ordinary bitumens, you can readily see why this is so.

First, because ordinary bitumens contain ingredients that evaporate at sun or working temperatures, they quickly become dry and brittle. Viskalt, on the other hand, even when maintained for five hours at a temperature of 325° shows an evaporation of less than ½ of 1%, and still remains pliant.

Second, ordinary bitumens crumble or crack when subject to tension or pressure. But Viskalt, as shown by the ductility test, is internally knitted together to resist such strains.

Third, without the aid of a fluxing agent, ordinary bitumens are not highly adhesive. Viskalt, however, as proved by actual use, binds itself fast both to the felt and to the structure.

Fourth, ordinary bitumens are extremely brittle at even 40°F. and flow at summer temperatures. Viskalt on the contrary, being only slightly susceptible to such ranges of temperature, remains firm yet pliant under stress.

As you can see from these facts, Viskalt is prepared to meet the exacting requirements of waterproofing in modern construction. Whether your job for it be on the roof or in the foundation, you may feel absolutely confident that Viskalt will remain *permanently* a continuous, unbroken layer absolutely impervious to water.

For further facts about the basic principles of permanent waterproofing, consult the article in the April issue.

Viskalt is made by a firm backed by over fifty years of manufacturing experience. There is a Viskalt preparation for every waterproofing need. For complete specifications just write the Construction Materials Division, Dept. 44-B

The RICHARDSON COMPANY
Lockland (Cincinnati), Ohio
Melrose Park (Chicago), Illinois New Orleans, La.

Viskalt
Pliant Under Stress

RICHARDSON *Product*

From the makers of Richardson Roofing (including Flex-a-tile Housetops), Viskote, Wallboard and similar products

© 1923, The Richardson Company

Logical Location for Textile Industries

Georgia has 201 textile plants, of which 115 or 57% are in cities served by the Central of Georgia.

Alabama has 74 textile plants, of which 27 or 36% are in cities served by the Central of Georgia.

The fact that these are successful, going concerns is convincing evidence that they are properly located.

This territory being supplied with hydro-electric power in ample quantity, and with nearby coal fields of Alabama and Tennessee, the question of power is fully solved.

While other essential requirements, such as labor, climate, adequate transportation and nearness to raw materials all combine to enable the Central of Georgia territory to offer those establishing new mills a location that is ideal and of proven value.

Further and detailed information will be gladly furnished upon request.

J. M. MALLORY, General Industrial Agent

CENTRAL OF GEORGIA RAILWAY

Savannah, Georgia

The beauty of an industrial structure lies in its economy

In the Borough of Brooklyn there stands an industrial plant recently completed by Lockwood, Greene & Co. for a client. The building is a model of convenience, efficiency and economy of construction costs. Utility was the first consideration. Nothing was spent on superficial ornamentation. Yet in its external attractiveness the building is a monument to the architectural skill of its designers.

In industrial work the test of an architect is in the use he makes of existing structural features, combining good proportion with proper scale, without the introduction of expensive ornamentation. For the beauty of an industrial building lies in its economy.

Lockwood-Greene service unites the counsel of engineer, architect, manufacturer and financial man. It builds plants that are technically right, architecturally expressive of their use and economically sound. It builds not only for the needs of the present, but with due allowance for the needs of the future.

Your problem is neither too big nor too small for Lockwood-Greene service. Write for a copy of "Building with Foresight," a booklet of achievements in industrial building.

Building With Foresight

LOCKWOOD, GREENE & CO.

ENGINEERS

EXECUTIVE OFFICE, 24 Federal Street, Boston 9

Boston Atlanta Chicago New York Detroit Cleveland Charlotte

Lockwood, Greene & Co. of Canada, Limited, Montreal

Compagnie Lockwood Greene, Paris, France

THE FUNCTIONS OF THE ENGINEER

The Cotton Mill that Finishes its own Cloth has these Dominant Advantages

1—It can obtain economies in time, freight and service.

2—It is in a position to brand its own product and build up good will with consuming public that will eventually create a permanent and stable demand for this known brand.

3—It will increase the economic independence of the mill, by assuring uniform quality, by synchronizing the finishing of the goods with production, and by giving the complete control of every process and by adding new sources of profit.

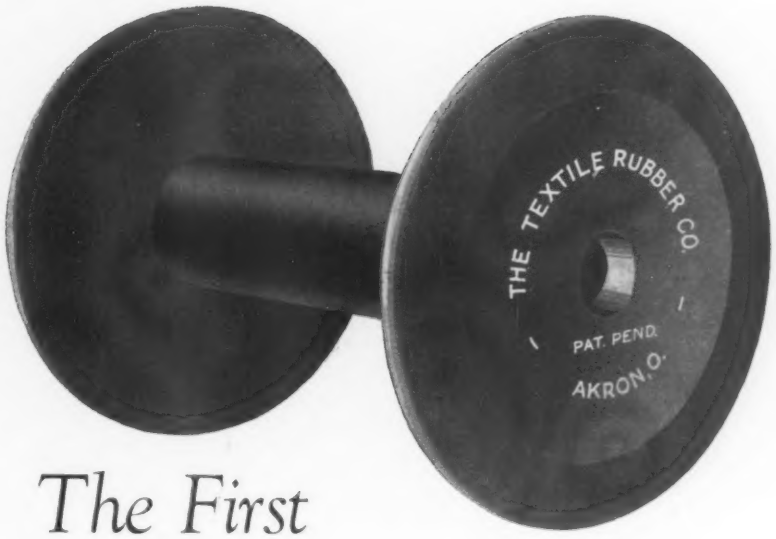
The profitable operation of a finishing department or plant depends on many factors most of which are of so technical a character as to call for the services of the Engineer in plan and design.

His counsel can frequently save large sums both in the original investment and in the operating cost.

J. E. SIRRINE & COMPANY

Engineers

Greenville South Carolina



The First Hard Rubber Spool

The superior qualities of hard rubber makes it the most ideal material possible for perfect textile spools.

It assures a spool that cannot be broken, splintered, bent or dented, even when given the roughest treatment.

It assures a spool with a perfectly smooth finish with no seams or projections to catch the yarn—a finish that will never wear rough.

It assures a spool whose heads will not loosen because it is made in one solid piece.

It assures a spool that will never warp, as moisture and climatic conditions have no effect upon it.

Test it yourself, and prove to your own satisfaction that it is the most perfect and economical spool possible.

Samples gladly sent to textile mills on request.

THE TEXTILE RUBBER CO.

225 OHIO BLDG. AKRON, OHIO

THE MORSE "ROCKER JOINT"

THE ROCKER JOINT SILENT CHAIN W

MORSE

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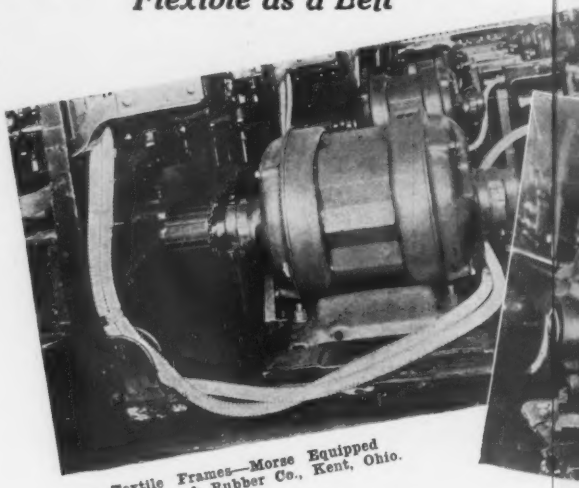
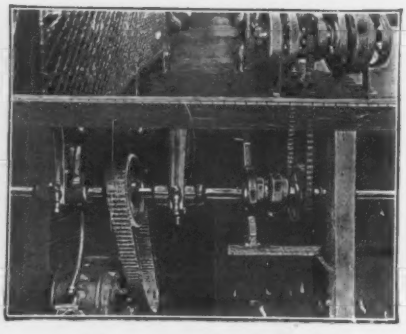
THE MORSE "ROCKER JOINT"

Flexible as a Belt

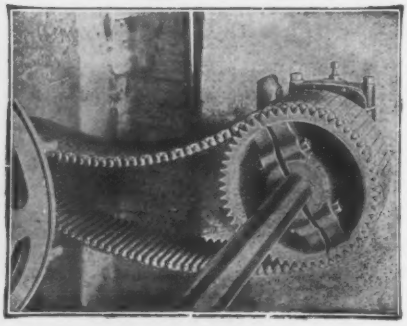
Individual Motor Drive to Knitting Machine



Textile Frames—Morse Equipped
Mason Tire & Rubber Co., Kent, Ohio.



Motor to Line Shaft Under Floor
Through Floor to Twisters.



Typical Lineshaft Drive.

The Ideal Drive for Ever

1 Smooth running, improving quality.

2 Uniform speed, increasing production.

3 Freedom from overhead construction.

4 Cleanliness — congenial working surroundings.

5 Better lighting, decreased fire risks.

6 No more belt slippage or stoppage to "take-up."

MORSE CHAIN CO.

Write today for boo

LARGEST MANUFACTU
SILENT CHAINS IN THE

Morse Engineering Service

BENEFIT BY MORSE SERVICE A

Address Nearest Offi

ATLANTA, GA.	Candler Bldg., Earl F. Scott & Co.	NEW YO
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CHARLOTTE, N. C.	404 Commercial Bank Bldg.	PHILADE
CHICAGO, ILL.	Merchants L. & T. Bldg.	PITTSBU
CLEVELAND, OHIO	Engineers Bldg.	SAN FR
DETROIT, MICH.	7601 Central Ave.	ST. LOU
KANSAS CITY, MO.	Finance Bldg., Morse Engr'g Co.	TORONT
WINNIPEG, MAN.	Dufferin St., Stro	

"MORSE" is the Guarantee Always Behind

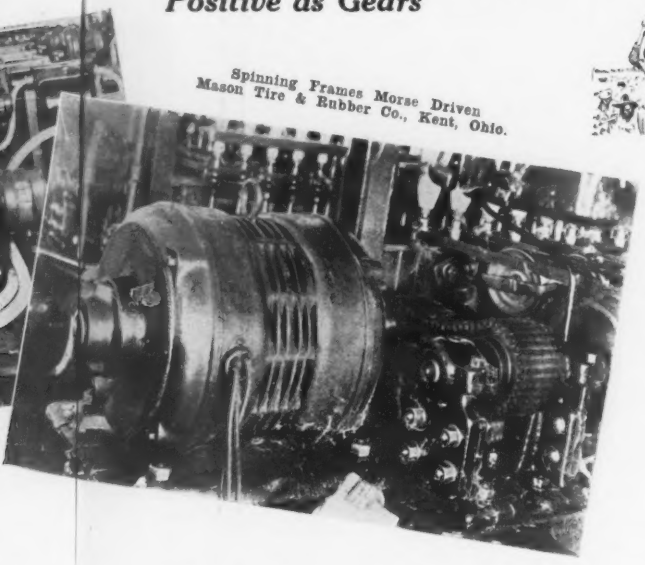
CHAIN WITH CENTER GUIDE LINKS

SILENT CHAIN

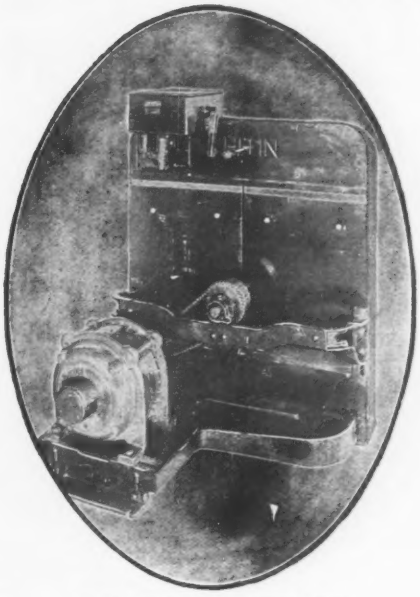
THE MORSE "ROCKER JOINT"

DRIVES

Positive as Gears



Spinning Frames Morse Driven
Mason Tire & Rubber Co., Kent, Ohio.



Head End Spinning Frame Drive

Every Textile Machine

7 100% overload on short centers with 99% efficiency.

8 Run cool, oil baths not required.

9 Quiet, delivering full power without vibration.

10 Positive speed ratios.

11 Strong, durable, no attention required.

12 The most economical drive to install and maintain.

y for booklet.

ITHACA, N. Y.

NUFACTURERS OF
NS IN THE WORLD

ERVICE AS OTHERS DO

Assistance Without Obligation

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NEW YORK CITY.....30 Church St.
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MONTREAL.....St. Nicholas Bldg., Jones & Glasseo Reg'd
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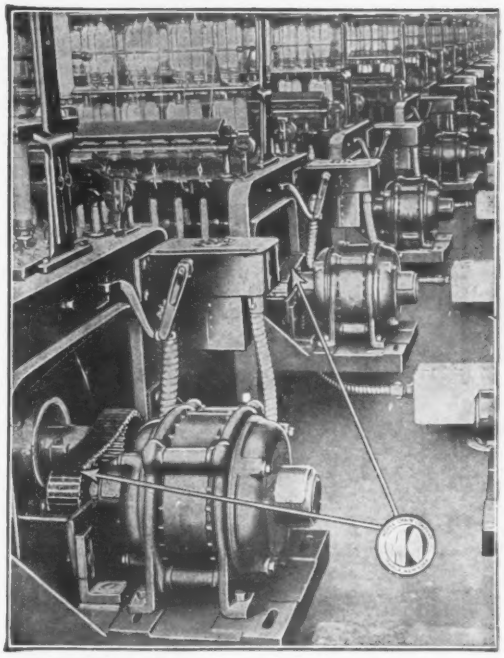
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock Bldg.
ST. LOUIS, MO.....Chemical Bldg., Morse Eng'rg Co.
TORONTO...Bank of Hamilton Bldg., Jones & Glasseo Reg'd
erin St., Strong-Scott Mfg. Co.



Standard Spinning Chain ½" Pitch

Spinning Frame 2½" wide, 8½" centers.

ind the Efficiency, Durability and Service

THE FOSTER CONE

Model Thirty 6" Traverse Cone, About 3/4 Regular Size

The Foster Cone gradually increases in taper or pitch and also changes the lay or wind of yarn on the Cone Surface as it builds up in winding.

This feature provides equal tension on the yarn when unwinding on the Knitting Machine.

A thoroughly tested practical Knitting Package for single, ply and mercerized Knitting yarn.

FOSTER MACHINE COMPANY

WESTFIELD, MASS.

John Hill, Southern Representative, Healey Bldg., Atlanta, Ga.

BIG RE-ORDER PROVES VALUE OF MINTER HOMES

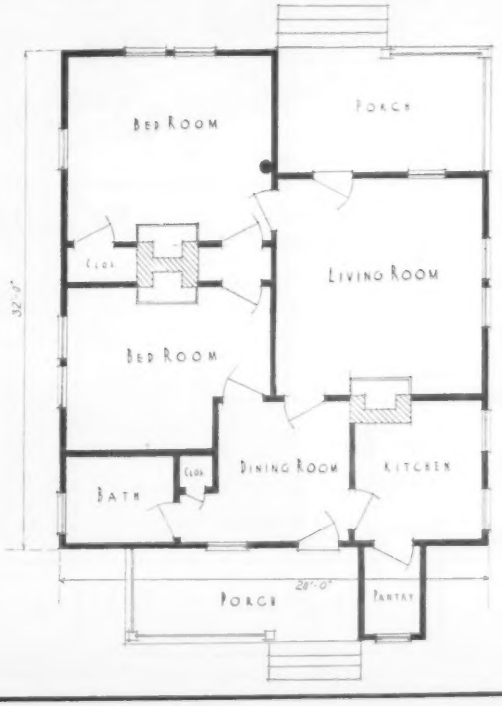
Photograph showing one of the thirty Minter Homes being erected for the F. W. Poe Manufacturing Company, of Greenville, S. C.. Floor Plan below.

The F. W. Poe Mfg. Co. of Greenville, S. C., has just ordered thirty Minter Homes. This is a repeat order and is proof of the value of Minter Homes.

The building of Minter Homes assures you of better homes, built quicker and at a lower cost than by the ordinary method of construction.

Every Minter Home is built by skilled, thorough and competent construction engineers.

Write for our special literature explaining the Minter System of Building



THE MINTER HOMES CO.

Greenville, South Carolina

MINTER HOMES CORPORATION

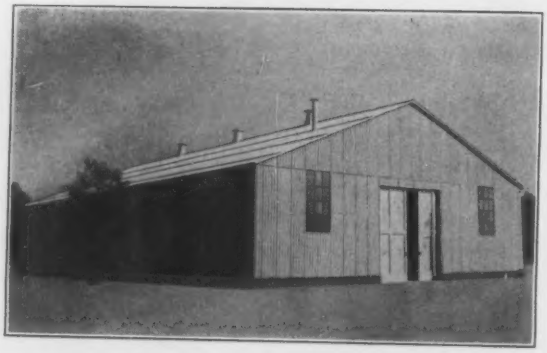
Huntington, West Virginia.

GEORGE DOWMAN

610-611 Walton Building, Atlanta, Ga.

Build Now to Last a Lifetime

THE MARYLAND METAL BUILDING PORTABLE YET PERMANENT Lyonore Metal



Erected for Md. State Roads Commission, Glenburnie, Md.

Maryland Metal Buildings are not affected by intense heat or extreme cold. They are rigid, weather tight, rust-resisting, last a lifetime, and offer every facility for good working conditions.

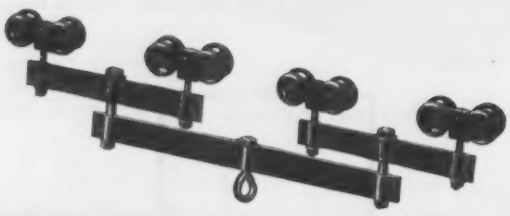
These buildings are fabricated in standard sections of interlocking units, and can be built at any time of the year by unskilled labor. They can also be dismantled with a salvage of 95%.

No need to rent if a building is needed quickly. Write us your requirements and the building you desire will stand erected complete in every detail—to last a lifetime.

MARYLAND METAL BUILDING COMPANY

Race & McComas Sts. Baltimore, Md.

WAGNER OVERHEAD CONVEYING EQUIPMENT



IS IDEALLY ADAPTABLE TO COTTON MILL OPERATIONS
CONSERVES LABOR---SAVES TIME AND FLOOR SPACE

Do your trucking on the ceiling and consolidate your conveying and hoisting operations. Wagner Equipment includes a complete line of Switches, Crossovers, Curves, and Cranes. Carriers are equipped with high grade roller bearings and can be furnished with "Hyatt" Roller Bearings if desired.

Write for Catalogue

Wagner Manufacturing Company, Cedar Falls, Iowa

BOCA SOLID STEEL SASH

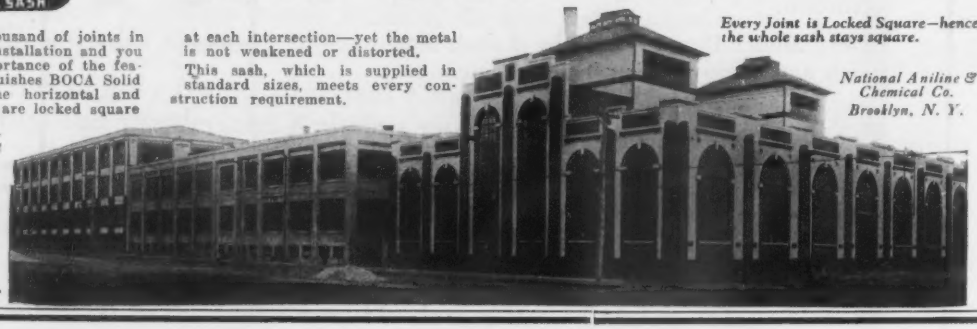
BOCA SOLID STEEL SASH

Consider the thousand of joints in a typical sash installation and you can see the importance of the feature that distinguishes BOCA Solid Steel Sash. The horizontal and vertical muntins are locked square at each intersection—yet the metal is not weakened or distorted.

This sash, which is supplied in standard sizes, meets every construction requirement.

Every Joint is Locked Square—hence the whole sash stays square.

National Aniline & Chemical Co. Brooklyn, N. Y.



Our fully descriptive catalog sent upon request.

THE BOGERT & CARLOUGH CO.
Paterson, N. J.

Southern Selling Agent for the Products on These

CONTRACTORS AND SALES ENGINEERS

FENCE
is part of the plant

It increases the working floor area of buildings by making protected *yard area* available for the storage of materials and goods.

It stops theft from the outside because the thief cannot get in,—and from the inside because you control the exits from your plant.

It stands on guard against that usually unforeseen day when trouble comes.

It controls traffic in and out of your plant. Employees are not interrupted by visiting friends relatives or walking delegates.

It decreases the hazard of fire to buildings and stored materials from carelessness or evil intent of the trespasser. It may reduce insurance rates.

Barriers of Steel
Afco Fences

with their angle posts, integral overhanging arm, strong, welded gates and other distinctive features make the ideal FACTORY FENCE. Manufactured by

American Fence Construction Co.
130 West 34th Street, New York

VARIETY FIRE DOORS

61 CROSS-HORIZONTAL FOLDING DOORS
ERECTER ON POSTS 7½ INCHES x 7½ INCHES
AMERICAN RAILWAY EXPRESS COMPANY'S BLDG.
CHICAGO, ILLINOIS

MANUFACTURERS OF A
COMPLETE LINE OF LABELED FIRE DOORS
ROLLING STEEL DOORS
HOLLOW METAL DOORS
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SAINO DOORS
VAMANCO COUNTER BALANCED ELEVATOR DOORS
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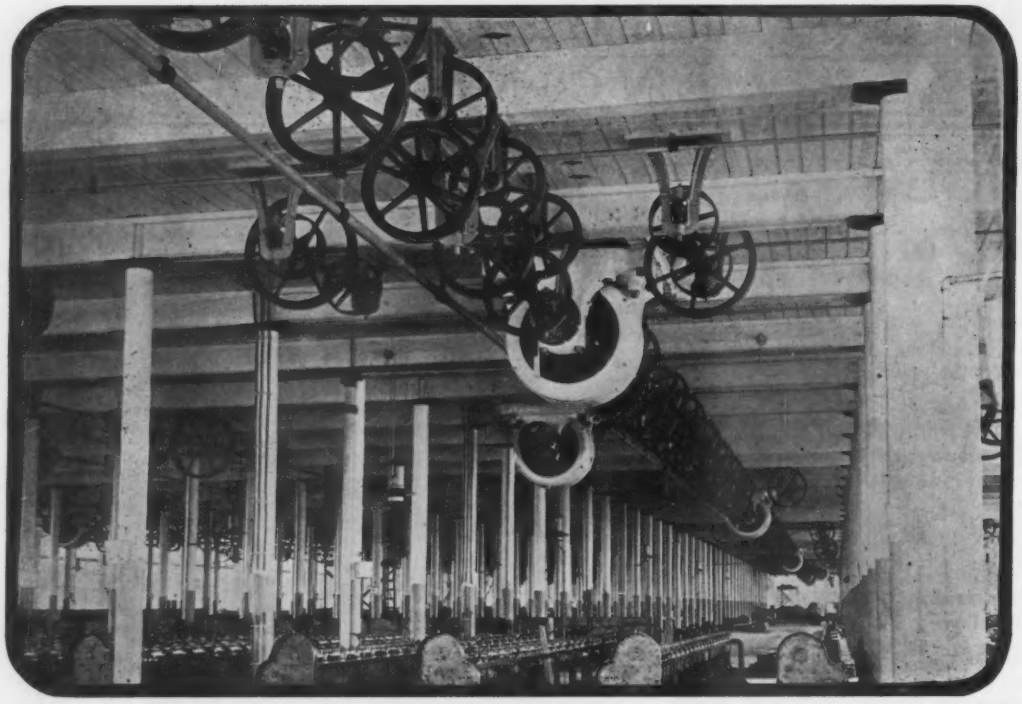
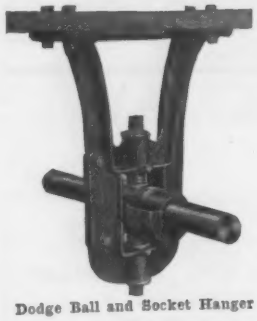
TIN CLAD DOORS
PRESSED STEEL FRAMES
STEEL STOREROOM DOORS

VARIETY FIRE DOOR COMPANY

2958 CARROLL AVE. CHICAGO, ILL.

Pages—Quality Products plus "Dowman Service"





Dodge Ball and Socket Hanger

Dodge Power Transmission Appliances Are Standard in this Mill

This large southern cotton mill installed Dodge Power transmission equipment when they built their first mill several years ago. In this case, as in thousands of similar installations in every industry, the performance of the initial equipment has led to the adoption of Dodge as the mill standard.

Large mill installations are generally assemblages of stock appliances—the efficiency of the complete system depends upon the merit of the individual units. Specifying Dodge as your mill standard means a complete power roadbed, economical in first cost and maintenance and backed by one well known and undivided responsibility.

Buy Dodge stock products from your local dealer on the immediate delivery basis—write our nearest branch for engineering service or special equipment.

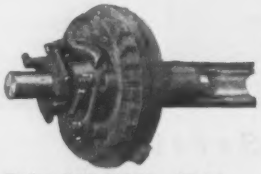
DODGE MANUFACTURING CORPORATION

General Office: Mishawaka, Indiana.

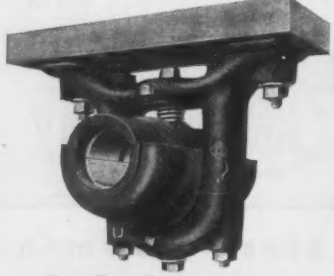
Works: Mishawaka, Ind., and Oneida, N. Y.

Atlanta St. Louis Cincinnati Philadelphia Houston Seattle New York
Boston Minneapolis Chicago Oneida San Francisco Newark Pittsburgh

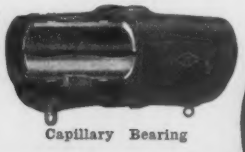
Oneida Split Steel Pulley



Dodge Split Friction Clutch

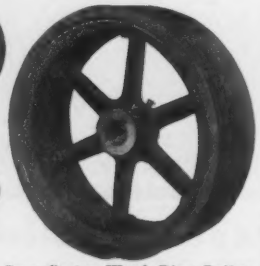


Short Drop Hanger

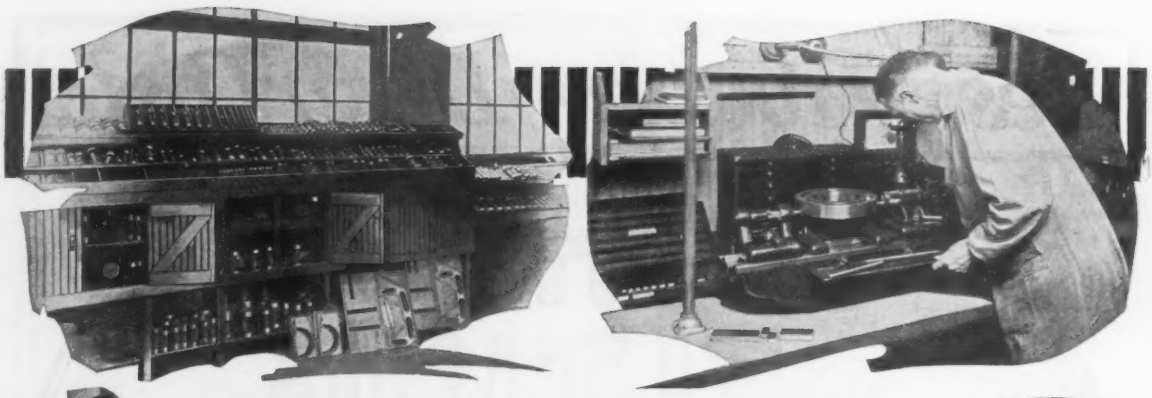


Capillary Bearing

Ring Oiling Bearing



Iron Center Wood Ring Pulley

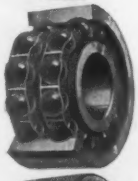


Temperature & Master Gages

That there may be no variation in measurement due to expansion and contraction, the temperature of the glass-enclosed and dust-proof room in which STROM Master Gages are kept is most carefully regulated.

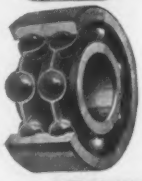
At regular, frequent intervals the shop gages are brought to this test room and compared with the Master Gages and with a standard *comparator* checked to .00001 of an inch. *No variation from laboratory standards is permitted in the STROM output.*

Maintaining accuracy of measurement means maintaining minimum of friction. STROM Ball Bearings as nearly approach perfection in measurement as untiring human watchfulness and constant machine precision can make them. Power flows through them with almost no resistance.



Install STROM guaranteed ball bearings—they save fuel and increase production

"Wherever a Shaft Turns"



(1975)

An Organization Built for Precision

Scientific in Principle and Practice

Less Trouble and Lower Costs

COCHECO BELTING

COCHECO TRADE MARK BELTING

COCHECO is a belting of unusually high quality. Every inch consists of the choicest selection from the hides—the strip taken from the backbone. These strips are the firmest, toughest and most durable leather that it is possible to obtain. They are tanned by the slow, old fashioned, white oak bark process, curried by our own special method, stretched and properly dried.

From 3″ light belt to 40″ double for main drives, COCHECO BELTING fills every need. It's the last word in economy and dependability.

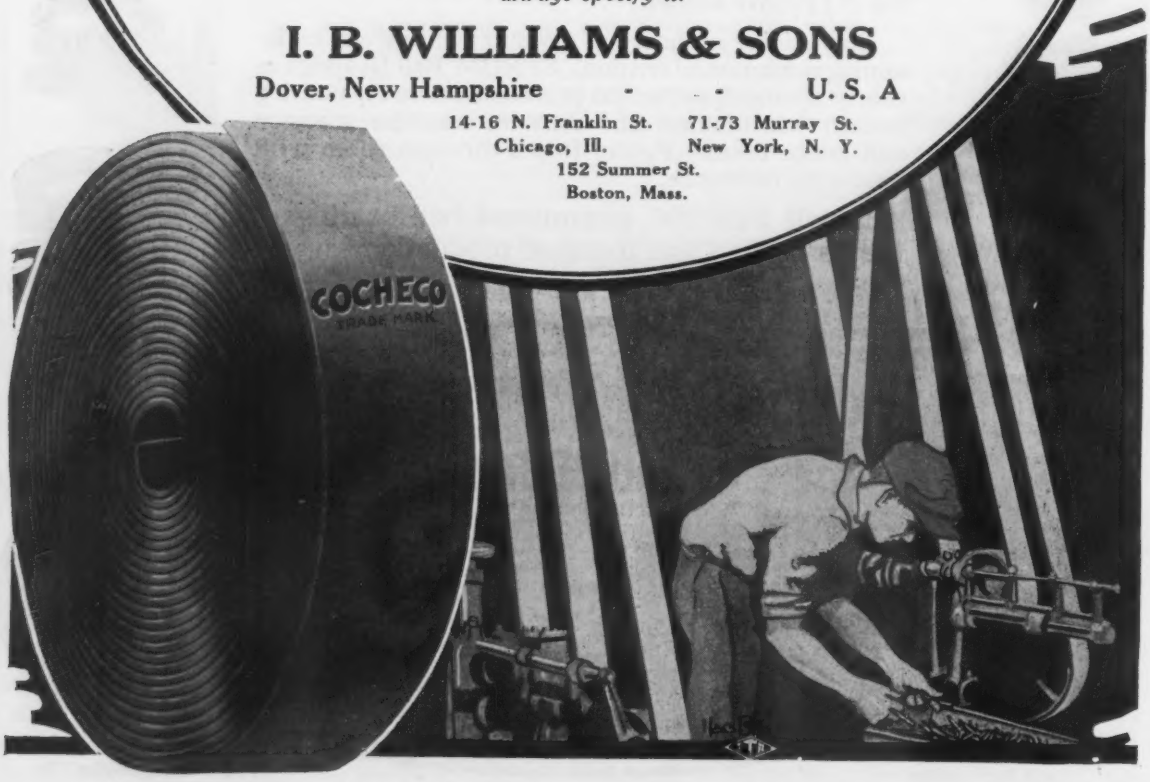
COCHECO BELTING Quality Belting Since 1842

Try one Cocheco Belt—keep tab on it—and you'll always specify it.

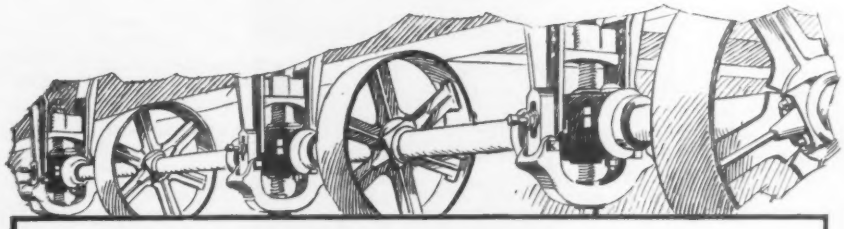
I. B. WILLIAMS & SONS

Dover, New Hampshire - - - U. S. A

14-16 N. Franklin St. Chicago, Ill.
71-73 Murray St. New York, N. Y.
152 Summer St. Boston, Mass.



Oil Them Only Four Times A Year



It is only necessary to oil Hyatt line shaft roller bearings once every three months.

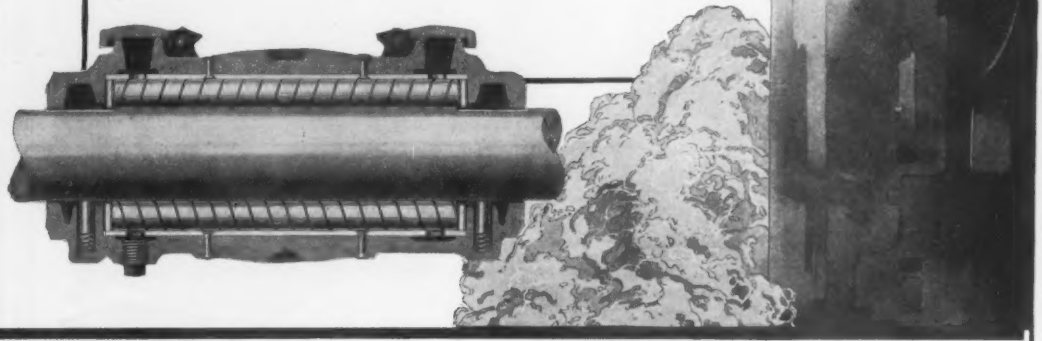
This reduces lubricant cost 80% (oil and labor).

Compare this with ordinary plain bearings that have to be greased 52 times a year.

The distinguishing features of Hyatt bearings are the hollow rollers. They act as reservoirs for the oil and discharge it through the slots in such a manner as to insure a constant distribution of oil over all bearing surfaces.

This self oiling action is only one of the many features that recommend Hyatt roller bearings to all factory executives. Others are: being split, they are easy to apply; they save at least 15% of total power; they give many years of satisfactory service without attention or repairs.

Secure Hyatt line shaft bearing economies for *your* plant.



'Phone The Nearest Mill Supply Dealer

Hyatt Roller Bearing Company

Newark, N. J.

Pacific Coast Address: Hyatt Roller Bearing Company, San Francisco, Cal.

Less Trouble and Lower Costs

COCHECO BELTING

COCHECO TRADE MARK BELTING

COCHECO is a belting of unusually high quality. Every inch consists of the choicest selection from the hides—the strip taken from the backbone. These strips are the firmest, toughest and most durable leather that it is possible to obtain. They are tanned by the slow, old fashioned, white oak bark process, curried by our own special method, stretched and properly dried.

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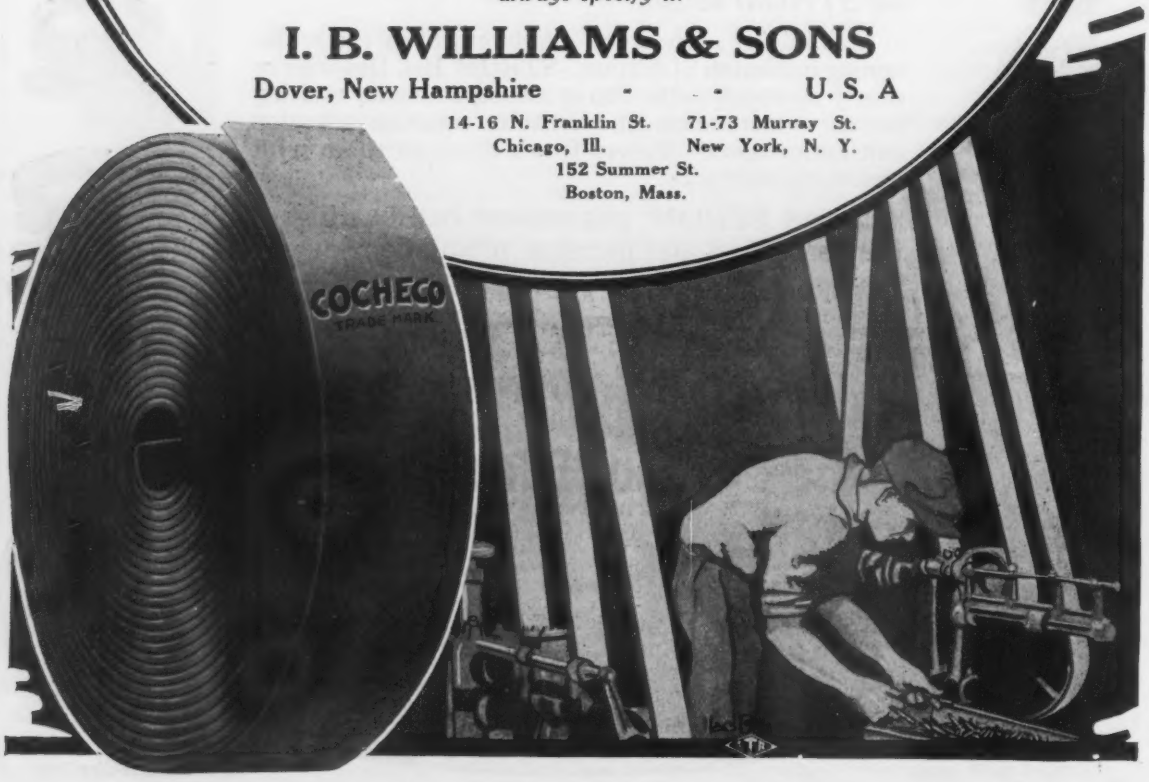

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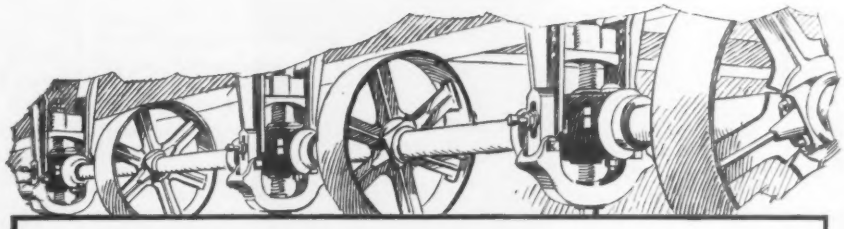

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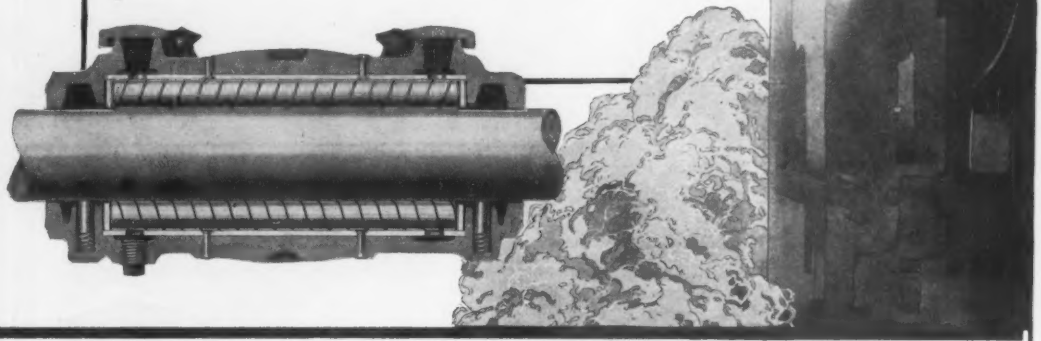


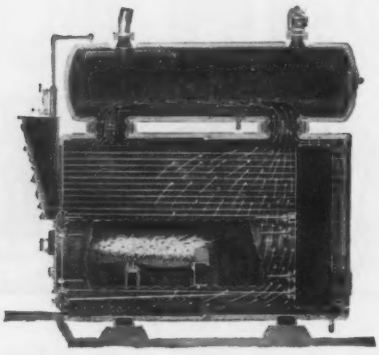
'Phone The Nearest Mill Supply Dealer

Hyatt Roller Bearing Company

Newark, N. J.

Pacific Coast Address: Hyatt Roller Bearing Company, San Francisco, Cal.

More Dry Steam With Less Fuel



HERE'S a perfect Scotch Boiler—a boiler that will generate more steam with less fuel.

Rapid, unrestricted circulation is absolutely necessary to the efficiency of any boiler, and while this feature is claimed for by many boiler manufacturers, the design of this boiler is such that it is positive at all times.

Large overload capacity, dry steam generated, and the remarkable flexibility of meeting fluctuating demands particularly adapts this boiler to severe conditions in industrial mills and plants.

Greatest economy is assured because of the circulating passage, which delivers water from the front neck to the bottom of the shell.

A constant temperature is assured because of this circulation which relieves uneven strains and stresses on this type of boilers.

There are no troublesome brick settings, as the boiler is self-contained and is ready for operation upon delivery.

Write today for detail information.

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

Southern Representative, Isaac Hardeman, Charlotte, N. C.

BOSTON **NEW YORK**
PHILADELPHIA **SAN FRANCISCO**

You Can Improve Your *Present* Mercerizers By Applying Hyatt Bearings

To secure the operating economies of yarn mercerizers equipped with Hyatt roller bearings it is not necessary to wait until new machines are needed.

Your present mercerizers can be easily and very satisfactorily equipped with Hyatt bearings by applying Hyatt replacement boxes.

Large textile mills in steadily increasing numbers are having Hyatt bearing replacement boxes applied to their mercerizers and are securing the same uniform mercerizing, cleanliness and economy that are secured when Hyatt bearings are built into new machines.

Secure these advantages by having Hyatt bearings applied to your mercerizers *now:*

Uniform Mercerizing: For perfect, even dyeing the yarn must be uniformly mercerized The freely and easily turning Hyatt bearing mercerizer rolls insure this uniformity.

Dependable Operation: All Hyatt bearing mercerizers built in the past 10 years are today giving excellent service with absolutely no bearing trouble.

Cleanliness: The oil-tight housings of Hyatt bearings on the top rolls prevent the oil from staining the yarn and keep the mercerizing solutions free from oil.

Durability: Hyatt bearings operate satisfactorily even on the caustic tank bottom rolls where they have no lubricant except the caustic solution itself.

Power Saving: The freely turning Hyatt bearing rolls not only reduce the strain on the yarn but make possible the operation of the machine with considerably less power.

Lubrication Saving: As all the oil applied to a Hyatt bearing mercerizer stays in the bearings to perform useful work there is a worthwhile saving in the cost of lubrication—oil and labor.

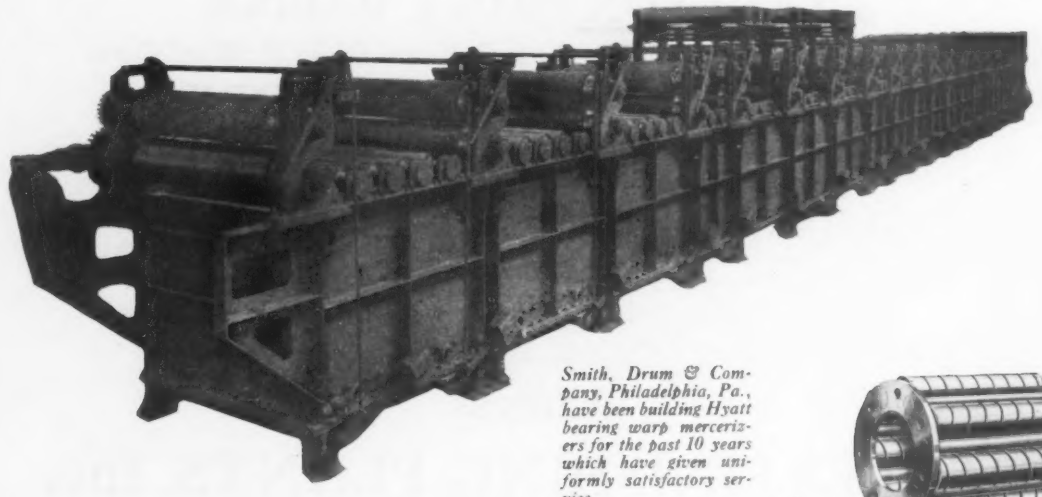
All the Hyatt bearing mercerizers built by Smith, Drum & Company in the past ten years are still giving excellent service with absolutely no bearing trouble.

Whatever type of mercerizers you operate it will pay you to write to us for complete information on how simply and inexpensively you can secure all the advantages of Hyatt bearing mercerizers.

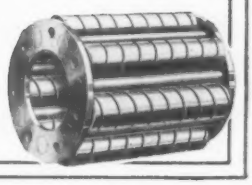
Hyatt Roller Bearing Company

Newark Detroit Chicago San Francisco

Worcester Milwaukee Huntington Minneapolis Philadelphia Cleveland Pittsburgh Buffalo Indianapolis



Smith, Drum & Company, Philadelphia, Pa., have been building Hyatt bearing warp mercerizers for the past 10 years which have given uniformly satisfactory service.



SAYLES FINISHING PLANTS, Inc.

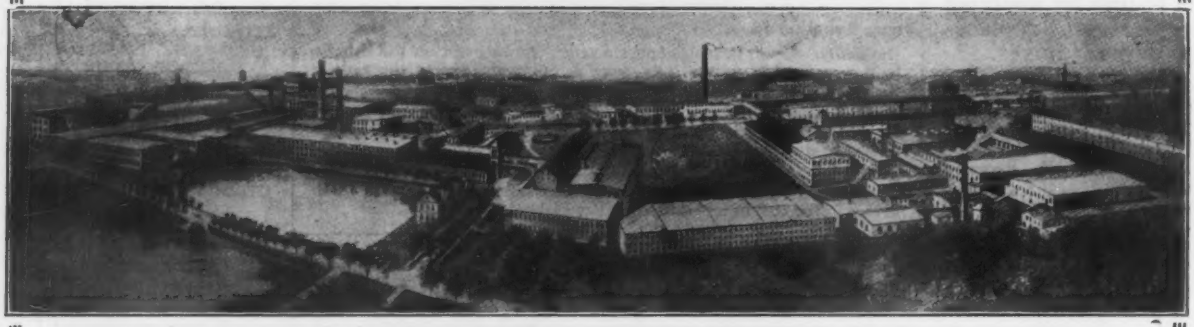
SAYLES BLEACHERIES	SAYLESVILLE, R. I.	PLANT A
GLENLYON DYE WORKS	SAYLESVILLE, R. I.	PLANT B
GLENLYON PRINT WORKS	PHILLIPSDALE, R. I.	PLANT C
GLENLYON YARN DYE WORKS	PHILLIPSDALE, R. I.	PLANT E
GLENLYON YARN DYE WORKS	CENTRAL FALLS, R. I.,	Winding Dept.
NEW YORK OFFICE	72 LEONARD ST., NEW YORK CITY	

SAYLES BLEACHERIES

BLEACHERS AND FINISHERS OF COTTON FABRICS

Wide Sheetings, Shirtings, Lawns, Fancy Dress Goods, India Linens, Nainsooks

ALL WEIGHTS AND WIDTHS



VIEW OF SAYLESVILLE WORKS

GLENLYON DYE WORKS

Mercerizers, Dyers and Finishers of Cotton Piece Goods

Dyers and Finishers of Worsted Dress Goods, Mohair Linings and Cotton and Wool Dress Goods.

GLENLYON PRINT WORKS

Bleachers, Dyers and Printers of Fine Cotton Goods and Fabrics of Silk and Cotton

GLENLYON YARN DYE WORKS

Bleachers and dyers of cotton yarn in ball warps and skeins, artificial and natural silk yarns. Colors fast to bleaching a specialty.

GLENLYON YARN DYE WORKS

Winding Department

Beamers, Warpers, Winders and Quillers.

FOR GENERAL INFORMATION

Address

SAYLES FINISHING PLANTS, Inc.

Saylesville, R. I.

"The Hallmark of Quality"

Applying Acquired Talent—

toward the practical and artistic color treatment of Fine Fabrics has been the life work of this—a pioneer organization.

Through intimate contact with intricate dyeing problems confronting us daily, it has been possible to *serve with distinction* the textile producer whose dyehouse facilities are limited to a conservative range.

U.P.D.W color applications and finishing operations concentrate wholly on *fabrics in the piece*—are characterized by consistently excellent handling in every particular.

United Piece Dye Works

DYERS, PRINTERS AND FINISHERS
IN THE PIECE OF

ALL COTTON GOODS
SILK AND COTTON MIXED GOODS
SILK AND WOOL, ETC.

New York Office
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LOWELL BLEACHERY SOUTH

Griffin, Ga.

Southern Branch of Lowell Bleachery
Lowell, Mass.

90 Years Experience in Finishing

Prepared to Serve Southern Mills

Cotton Piece Goods: Crashes, Ducks, Drills Twills; Shrunk, Linen, Chased and Calendered Finishes.

Mill Accounts Solicited

Butterworth Cotton Rolls are made of Long Staple Cotton

—and the reason is, that *long staple cotton rolls* stand up longer under hard service and require fewer refills, than any other cotton roll we have been able to make even with our years of experience.

We also make combination rolls—cotton and husk, cotton and excelsior, cotton and wool—long staple cotton is used in these—then there are paper rolls, husk rolls and coir fibre rolls.

H. W. BUTTERWORTH & SONS CO.
Established 1820
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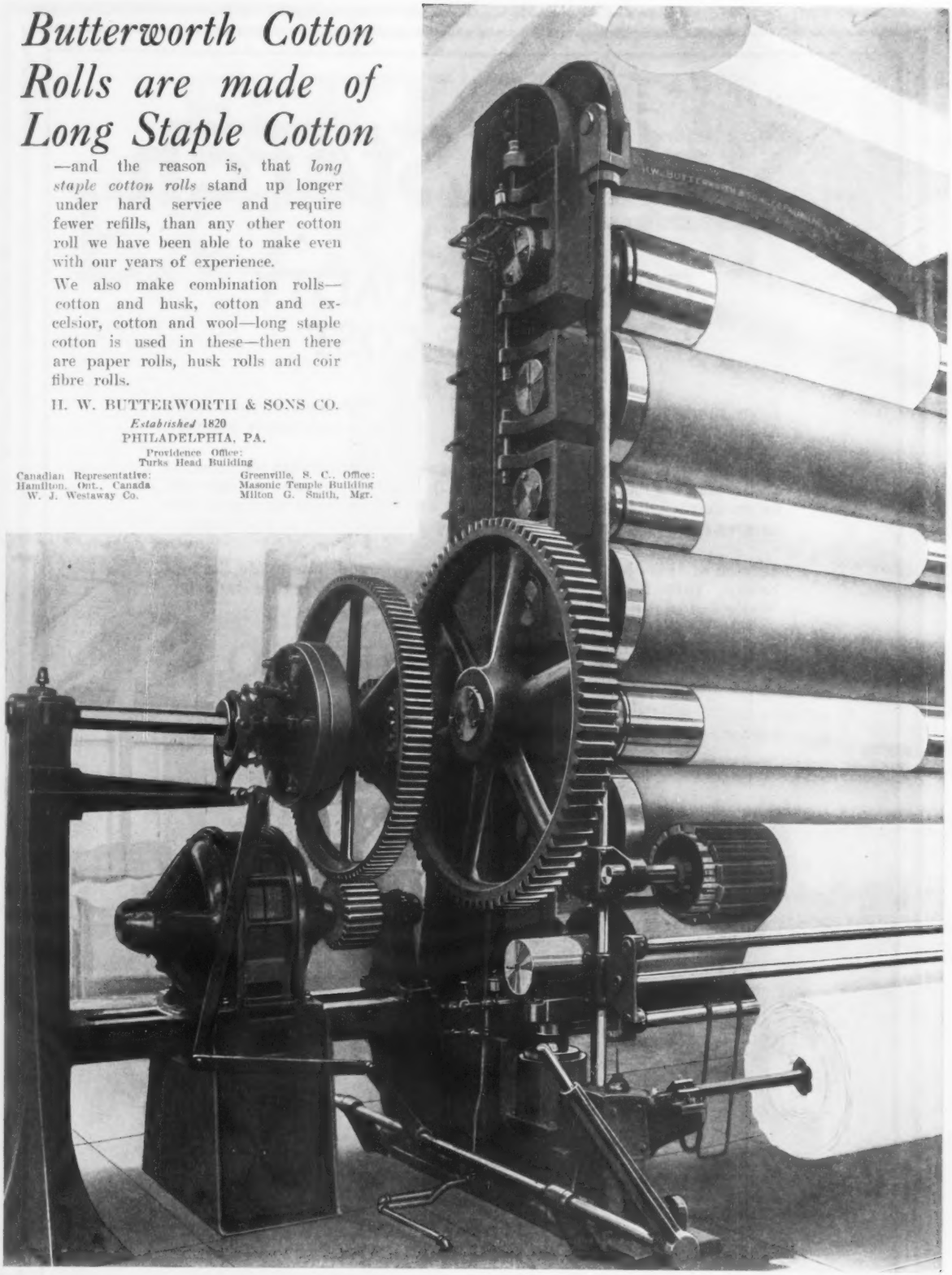
Providence Office:
Turks Head Building

Canadian Representative:
Hamilton, Ont., Canada
W. J. Westaway Co.

Greenville, S. C., Office:
Masonic Temple Building
Milton G. Smith, Mgr.



BUTTERWORTH *Finishing* MACHINERY

Staley's Starch

IMPROVES QUALITY
REDUCES COST

Even more important than the economy of Staley's Eclipse Thin Boiling Starch is the improvement in quality of output made possible.

Seconds are virtually eliminated, and there is a minimum shedding at the looms. Fibers of the yarn are thoroughly cemented together, increasing tensile strength 10% to 15% more than thick starches. This assures excellent weaving, with a smooth, pliant warp as the result.

Service of this character, consistently maintained, has made Staley's Eclipse Thin Boiling Starch the standard of the textile industry. Write for samples and prices.

A. E. STALEY MFG. CO.

DECATUR, ILLINOIS

508 Andrews-Law Bldg., Spartanburg, S. C. | J. W. Pope, Ansley Hotel, Atlanta, Ga. | 25 Church St., New York City | 88 Broad St. Boston, Mass

FLETCHER EXTRACTORS

Electric Underdriven Extractor

The good name held by Fletcher Extractors in the textile field is not the result of isolated cases of satisfactory performance, but has been earned by the year in and year out dependability of *every* extractor which has left the shop during the past fifty years.

Steam Turbine Driven Extractor

The latest types of Fletcher Extractors retain the simplicity, ruggedness, and durability for which their predecessors are famous, and in addition embody all the latest improvements which decrease running costs and aid production.

You should know more about these modern extractors. Write for complete information.

Vertical Motor Driven Extractor

FLETCHER WORKS

(Formerly Schaum & Uhlinger)

Glenwood Avenue and Second Street

PHILADELPHIA, U. S. A.

Southern Representative: W. A. Kennedy, Charlotte, N. C.

Beam Bleaching and Dyeing

(Brandwood's Patents)

Up to twelve Beams, or three thousand pounds and up to fifteen hundred pounds of CHEESES bleached or dyed, Indigo, Vat, Naphthol, Sulphur and Direct Colors ***at one operation.***

Cost in labor and materials guaranteed less than by any other System.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

Users of our Bleaching and Dyeing Plants have the exclusive free benefit of Twenty United States Patents, giving great advantages in Warping, Bleaching, Dyeing, Drying, Quilling and Splitting, and not available by any other System.

We further give the use of valuable secret processes, and many years' practical experience. We start up the Plants free, and give free service at all times.

Reckoned on basis of production, our Plants are cheapest in first cost.

We are prepared to install Plants and take payment, as and when saved by their use.

Most of the Chambrays and stripes now manufactured in the U. S. and Canada, are bleached and dyed on our Plants.

Exclusive Patent Rights are still available for some States and Territories.

Raw Stock Bleaching and Dyeing

(Brandwood's Patents)

Bleaching or Dyeing continuously in One Apparatus up to fifteen hundred pounds per hour, Indigo, Vat, Naphtol, Basic Developed, Sulphur and Direct Colors.

Cost in Labor and Materials guaranteed less than by any other system.

Dyehouse labor in handling the cotton before and after dyeing, and hydro-extracting is eliminated.

Three-fourths of the labor costs and three-fourths of the dyehouse floor space is saved.

Spinning production considerably increased.

No shortening, weakening or matting of the cotton.

Colors brighter and evenly dyed.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

We start up the Plants free and give free service at all times.

Exclusive Patent Rights are being granted to Colored Goods Manufacturers for their own State or Territory.

For full particulars apply to

JOHN BRANDWOOD

ELTON COP DYEING CO., LTD.

BURY, ENGLAND

AMERICAN
DYEWOOD CO.

A Service for Cotton Dyers

Dyeing problems, if presented to our experts, are solved entirely from your point of view.

We aim to suggest methods by which you may secure just the shades you seek, using dyestuffs suited to your particular requirements at the lowest cost to you.

There is no charge for this service

We keep in stock full lines of sulphur colors and developed colors; also cutch, bark, fustic and Logwood in natural colors.

Ask for our specialties in fast to light direct colors.

AMERICAN DYEWOOD COMPANY
NEW YORK · BOSTON · PHILADELPHIA · HAMILTON, ONT.
Works at CHESTER, PA.

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ANILINE COLORS

DIRECT, SULPHUR, ACID, BASIC AND CHROME
including the following new Product

BRILLIANT SULPHUR BLUE T. C. M. CONC.

THE BEST MONEY VALUE BLUE FOR CHAMBRAYS

VELVETEEN PASTE

THE STANDARD BOIL-OFF & DYE BATH ASSISTANT

U. C. TALLOW

THE HIGHEST GRADE OF PURE SIZING TALLOW

KING BRAND SIZING

OUR "K.B." IS A COMPLETE SIZE IN ITSELF. HIGH IN TALLOW

WAX SOFTENER

A SCIENTIFICALLY BLENDED SOFTENER FOR BLEACHED GOODS

UNITED CHEMICAL PRODUCTS CORPORATION

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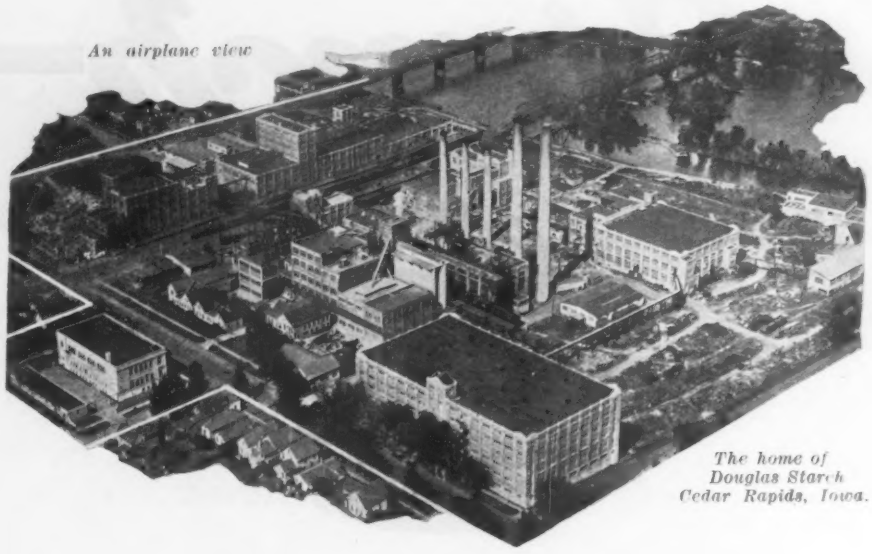
REPRESENTATIVES: R. T. GRANT, Charlotte, N. C.
GEO. W. WATSON, Hazlehurst, Miss.
C. D. MAIGATTER, Charlotte, N. C.

An airplane view



The home of Douglas Starch Cedar Rapids, Iowa.

Douglas Textile Starches

Again available in all the various grades

For twenty years Douglas Starches have been used by the Textile Trade—having the highest reputation for quality and uniformity of any starches on the market.

The Douglas Company's plant has been purchased by Penick & Ford, Ltd., and rebuilt, including every worthwhile improvement known to the science of the industry. It is now operated by the same efficient organization as was formerly employed, thus assuring the highest standard of quality.

Douglas Starch is available in all special and standard grades—

DOUGLAS CROWN STARCH (a refined thin boiling starch)
DOUGLAS PEARL STARCH
DOUGLAS POWDERED STARCH
DOUGLAS WARP SIZING STARCH
DOUGLAS LION MILL STARCH

Our representative will promptly supply samples and full information. Write to

PENICK & FORD., Ltd., Inc.

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New Orleans, La.	*Southern Representative*	*N. E. Representative*
Montgomery, Ala.	G. L. Morrison	Marble, Nye & Co.
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Starch

400 MILL
500 MILL

FAMOUS N
C. P. SPECIAL

Blue River Crystal

These STARCHES are manufactured by carefully controlled and standardized methods.

PURITY and UNIFORMITY are secured by accurate laboratory tests.

ECONOMY and EFFICIENCY are proven by the constantly increasing number of exacting cotton manufacturers who are getting satisfactory results by using our STARCHES especially selected for their conditions.

Recommendations are based upon intelligent investigation of each individual problem.

Corn Products Refining Company

New York

Southern Office *Greenville, S. C.*

Starch

MATHIESON Chemicals

Service That Protects You

WHEN you specify Mathieson Chemicals you take advantage of a service that eliminates delivery uncertainties. Our own stocks of "Eagle Thistle" products are carried on consignment with our carefully selected distributors, whose warehouses are in principal cities throughout the country.

These stocks are for the service of less-than-carload users and for the emergency supplies of carload consumers. You deal with us, just as though shipment were made direct from our works.

Can you afford not to avail yourself of Mathieson service?

The MATHIESON ALKALI WORKS *Inc.*
25 WEST 43rd STREET NEW YORK CITY

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EAGLE THISTLE PRODUCTS

Deal Direct with the Manufacturer

Hydroxy Art Silk Coning Oil

A Specially Prepared Oil

Used in the Coning, Winding, and Knitting of Artificial Silk.

Makes Artificial Silk Knit Smoothly.
Eliminates Breakdowns. Reduces Seconds.
Washes out easily at low temperature.

Therefore—
Dyeing and Bleaching is even and shades brighter.

Sample sent on request—no charge.

Developene (There Is no Just as Good)

Makes a rusty Black stocking turn deep Black.

Kali Chlorine Neutralizer

An anti-chlor—prevents tender bleached goods.

All chemicals for the Dye House—
All oils—Sulphonated—Turkey Red—
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KALI MANUFACTURING CO.

1410 No. Front St., Philadelphia, Pa.

Sole Manufacturers of "Hydroxy Oils" Patented.

FOR WARP SIZING

Reduces breakage:

Soluble Wheat Starch Binder possesses great penetrating power, and also helps the other ingredients of the size mixture to penetrate, causing every fibre of the yarn to become thoroughly sized. The result is greatly increased tensile strength, and consequent reduction of breakage.

Reduces shedding:

Soluble Wheat Starch Binder "binds" the ingredients of the size mixture to the yarn until each has performed its full mission. This prevents excessive shedding and its incident troubles.

Demonstration gladly given.

Also serving the textile industry with:
"Hawk" Thin Boiling Starch
"Gold Medal" Refined Starch
"Silver Medal" Pearl Starch
"R. A. Brand" Imported Potato Starch

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61 BROADWAY
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SOUTHERN OFFICE:
CHARLOTTE, N. C.
PROVIDENCE
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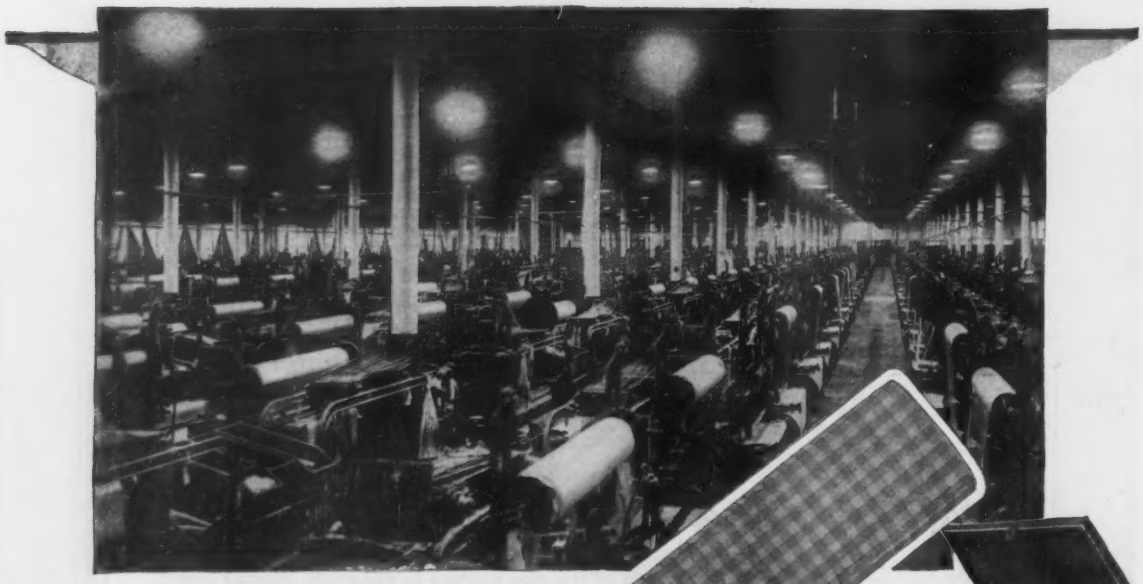
QUALITY AND SERVICE SINCE 1866

Is your lighting—and output—below normal?



Keep Your Voltage Up and Cut Down Waste

Waste is one of the worst "bug-bears" of the manufacturer.

Oftentimes decreased output is a result of improper lighting, and too frequently the trouble with illumination lies in the voltage. Only a 10% drop in voltage causes a 30%, and more, reduction in candle-power. So the latest types of fixtures and lamps will avail but little unless normal lamp voltage is maintained.

To those mills buying unregulated electric power from a Central Station, G-E Induction Regulators are of great value in holding constant voltage on lighting circuits to insure the best working conditions and consequent maximum output.

Central Stations find Induction Regulators a necessity for lighting feeders. Put them on *your* lighting circuits also.

Induction Voltage Regulator, outdoor station type

Pole type

General Electric Company
Schenectady, N. Y.
Sales Offices in all Large Cities

GENERAL ELECTRIC

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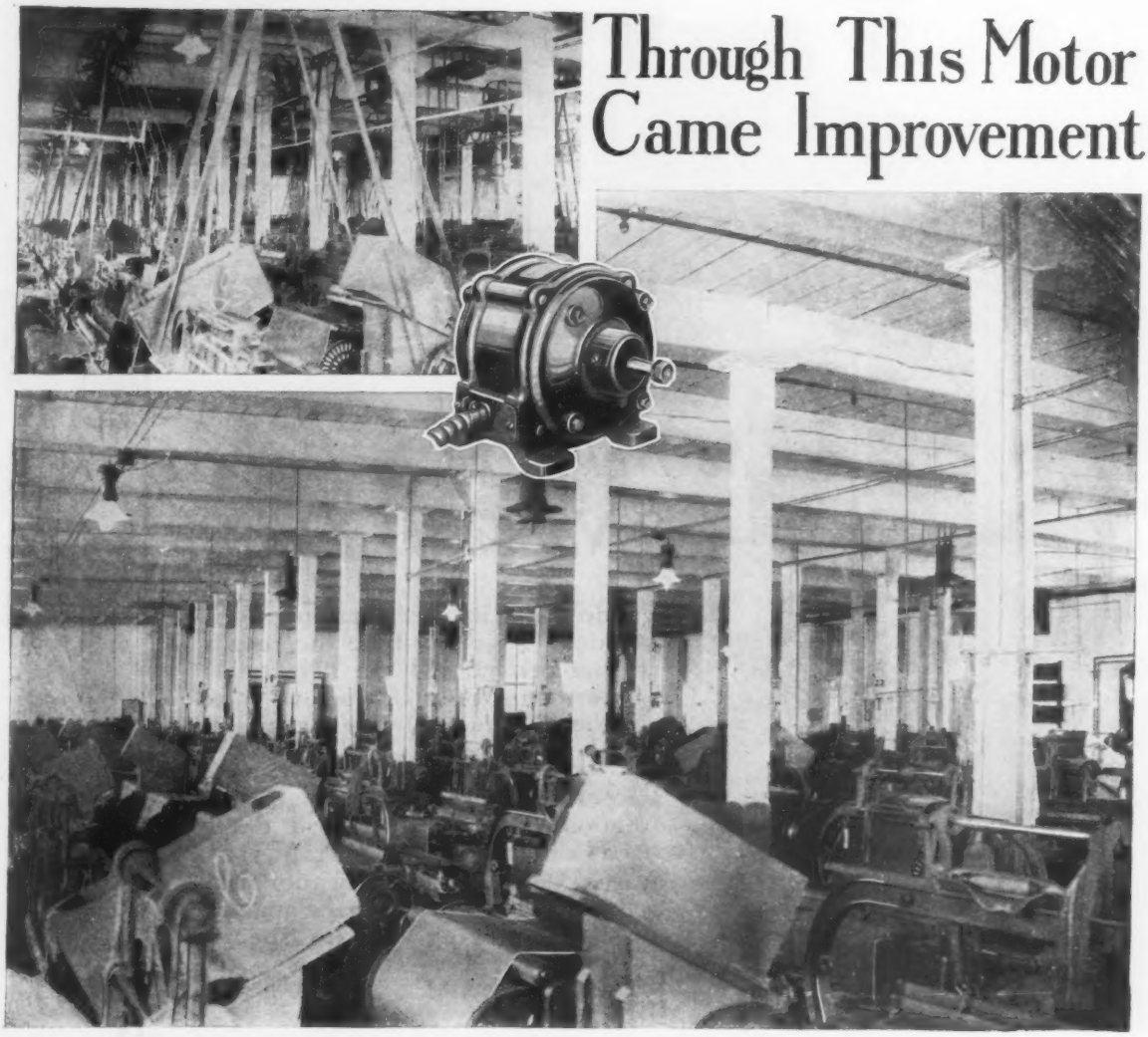
Through This Motor Came Improvement



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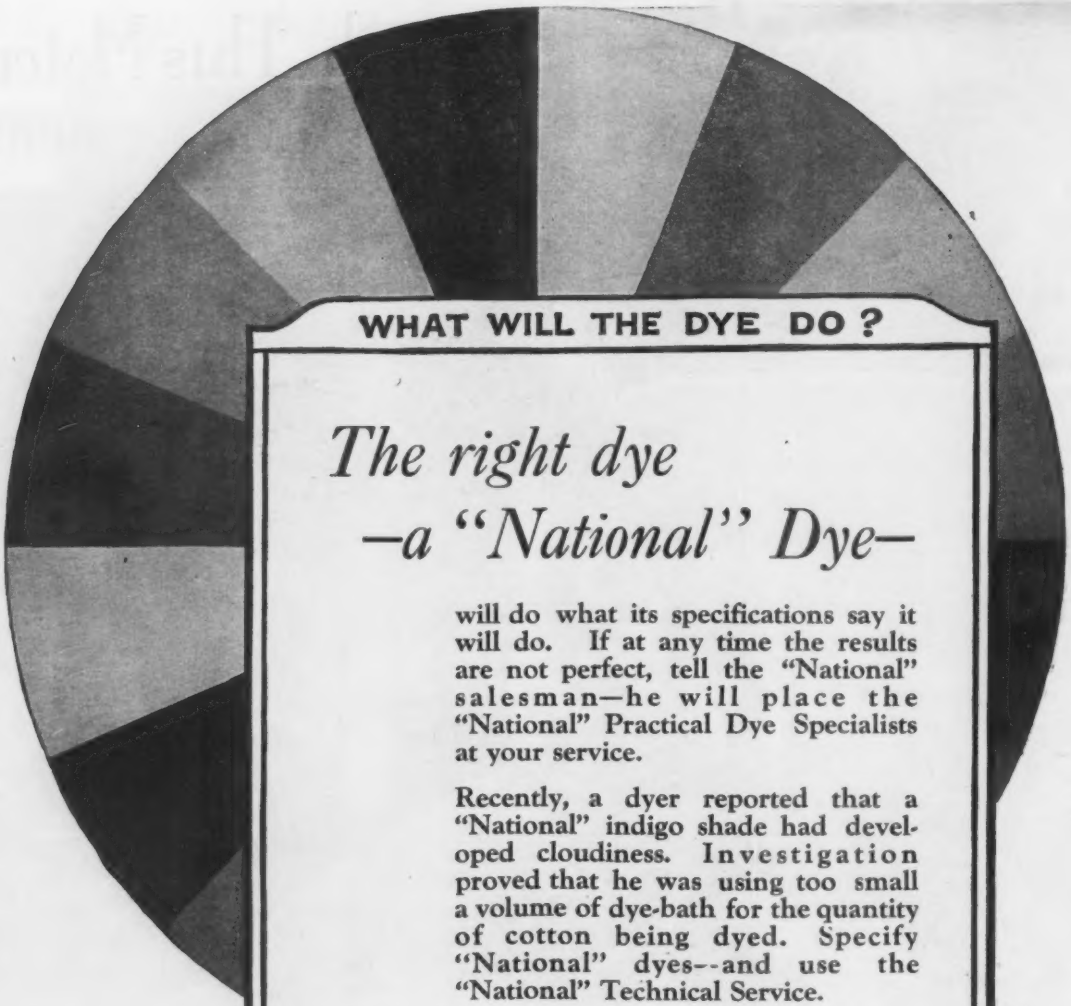

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FOR TEXTILES

NATIONAL U.S.A. DYES

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. R. W. PHILIP, Associate Editor.

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Volume 87

Member Associated Business Papers, Inc.
Member Audit Bureau of Circulation.

No. 7

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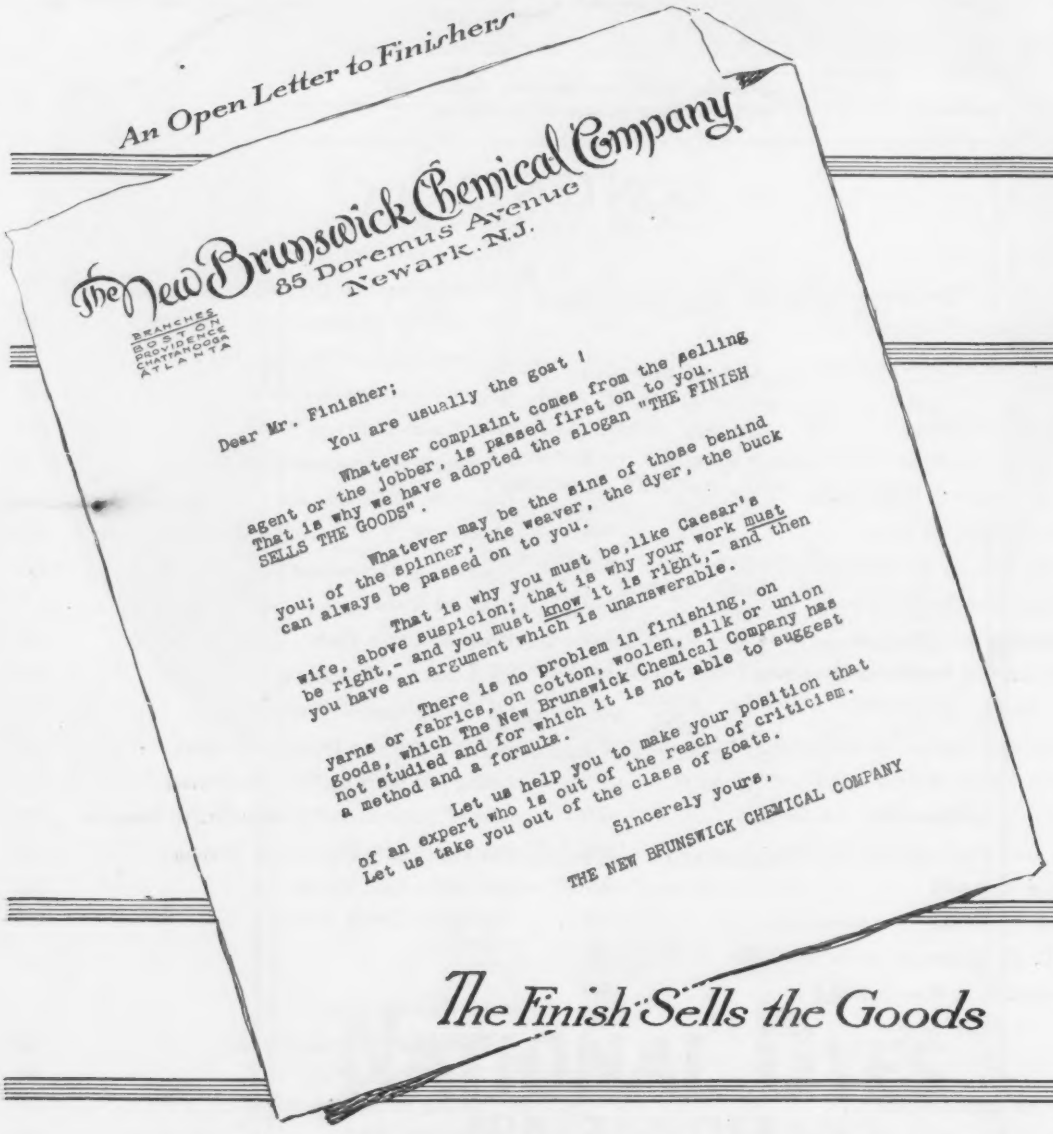
"The Finisher is Usually the Goat"

An Open Letter to Finishers



The New Brunswick Chemical Company
85 Doremus Avenue
Newark, N.J.

BRANCHES
BOSTON
PROVIDENCE
CHATTANOOGA
ATLANTA

Dear Mr. Finisher;

You are usually the goat !

Whatever complaint comes from the selling agent or the jobber, is passed first on to you. That is why we have adopted the slogan "THE FINISH SELLS THE GOODS".

Whatever may be the sins of those behind you; of the spinner, the weaver, the dyer, the buck can always be passed on to you.

That is why you must be, like Caesar's wife, above suspicion; that is why your work must be right,- and you must know it is right,- and then you have an argument which is unanswerable.

There is no problem in finishing, on yarns or fabrics, on cotton, woolen, silk or union goods, which The New Brunswick Chemical Company has not studied and for which it is not able to suggest a method and a formula.

Let us help you to make your position that of an expert who is out of the reach of criticism. Let us take you out of the class of goats.

Sincerely yours,

THE NEW BRUNSWICK CHEMICAL COMPANY

The Finish Sells the Goods

Sizes **Solvents** **Softeners**
Waxes **Waterproofs** **Soluble Oils**

The New Brunswick Chemical Company
Representatives at
BOSTON - PROVIDENCE - CHATTANOOGA - ATLANTA
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With the Publishers—

Obtaining CO_2 In Advertising

The term CO_2 in combustion engineering means the gases of complete combustion. Broadly speaking it is the indicator by which an engineer may determine whether he is obtaining the utmost of combustible results from the amount of money he is spending for fuel.

In order to burn coal with economy and secure the most heat units therefrom it is necessary to place the fuel on the fire at regular and frequent intervals, and to see that the grate surface is covered to an even depth. A thinning down of fuel in spots will allow cold air to mix with the gases of combustion reducing their temperature and therefore allowing heat losses which should be avoided, while the piling on of too much fuel in other spots, in an attempt to compensate for these thin places, only aggravates the trouble by producing a still greater volume of volatile gases, which, lacking the proper temperature for combustion, make themselves evident in the form of smoke.

Purchasing advertising is analogous to burning coal.

First, it is necessary to fully cover the fields you wish to cultivate through the pages of a carefully selected list of business journals that regularly reach those particular classes of people who are in a position to demand and use your equipment.

Second, you must spread your advertising appropriation so it will produce the most sales per dollar expended. Sales, not inquiries, pay dividends—note the distinction.

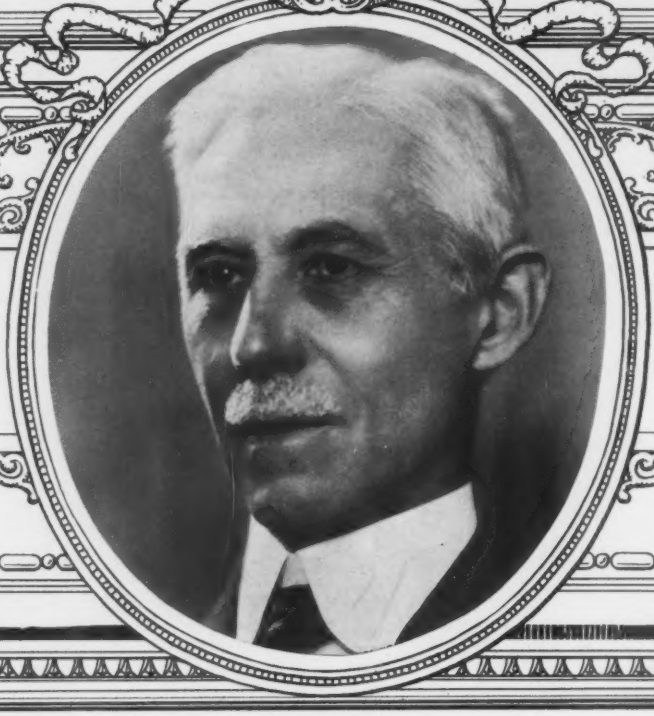
Third, your advertising copy should be applicable and attractive.

Fourth, your products should be suitably represented by competent salesmen in each field from which you desire a volume of business.

Assuming that the prospects for business are about evenly divided over your whole territory, a reduction of space in a medium best suited to one part or section in order that you may increase space in a medium that is strong in another part or section, is equivalent to piling coal on one section of your furnace grate and leaving holes or thin places at another point. You are not only losing prestige and sales in the section so slighted, but you are also allowing competitive equipment to attain a lead that it will take much effort to overcome.

Your sales volume from a field is your CO_2 recorder that tells if you are handling your entire sales proposition in an efficient and successful manner, or whether you, like the careless fireman in the boiler room, are merely making smoke.

AMONG COTTON'S READERS



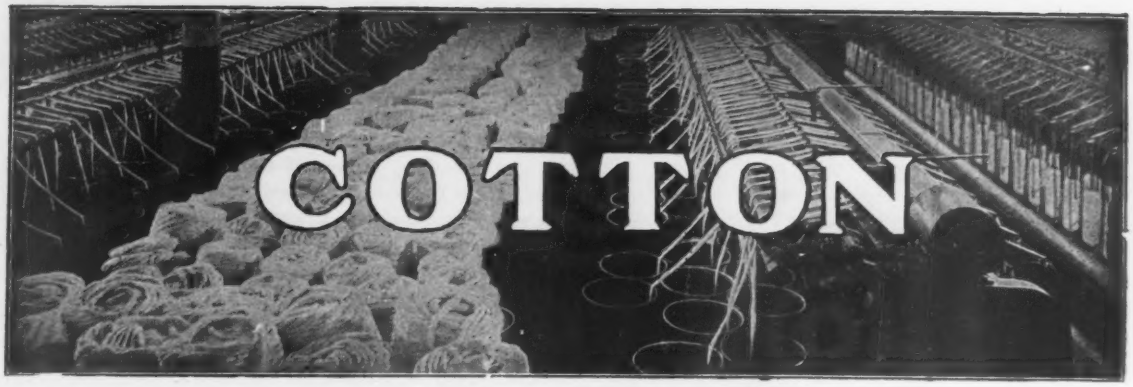
C. E. Hutchison

President and Treasurer
American Yarn and Processing Company,
Mount Holly, N. C.

President American Cotton Manufacturers' Association

"I have found COTTON one of the most valuable publications which come to our office. I am particularly impressed with the discussions of practical mill men which frequently appear therein. I have never found an issue which did not contain much valuable and entertaining information."

C. E. Hutchison



May, Nineteen-Twenty-Three

Ten Years of the Federal Income Tax.

With a sort of Oriental fatalism, Americans are prone to accept decisions on important national questions as final and beyond recall. This is particularly true of national legislation having to do with economic problems. Once an issue crystallizes into a statute even those who take the opposing viewpoint rarely ever bother to check up on practice to find proof or disproof for what is set forth in theory.

Patently such is the case with reference to the Sixteenth Amendment to the Federal Constitution—the measure which inaugurated the Constitutional "amending fever" that has raged during the last dozen years. Only a few years ago, many of the ablest men in America were stressing very serious objections to the Federal income tax, which that amendment authorized, as an arm of the national government. To what extent have their objections proven valid in the light of ten year's experience with this, the greatest adventure in the realm of fundamental policy undertaken by the Federal Government between the period of the Civil War and the year 1913 when the first Federal income tax act, under the Sixteenth Amendment, was passed?

A careful study of the record indicates that practically every one of them has been proved sound. Moreover, practice has evolved additional ones which none of the erstwhile opponents of the income tax anticipated, i. e., it has abetted some of the very evils which even its opponents thought it might correct.

Practice has proved scarcely more than one contention of its friends: It has been a wondrous source of public revenues. But only a few of its old-time friends advocated the income tax on that ground. It, they claimed, was to shift rather than increase the burden of taxation, and in doing that it was to facilitate a more equitable distribution of the wealth of the country.

But with the introduction of the Federal income tax, the burden of all taxation began to grow. In recent years this burden has increased so rapidly that impartial students of the subject, such as the specialists attached to the National Industrial Conference Board, declare that it is verging upon the unbearable.

The item of the burden which has grown most is that of Federal taxation, and that growth no doubt is due in great measure to the recent war. But the income tax—in that it gives Congress ready and politically safe means for amplifying the revenues—is responsible for much of it. That the war isn't responsible for all of it is shown by the fact that there has been almost as much increase in State and local as in Federal taxation. It may seem far-fetched to charge that to the Federal income tax but considerable portions of it is directly so chargeable. For, aside from the spending pace set by the Federal Government and followed by other units of government, Congress, by virtue of the income tax, practically has compelled the States and local governments to increase their indebtedness and their taxes in order to meet the terms of so-called "fifty-fifty" appropriations.

Taxation in these United States, according to the National Industrial Conference Board, now amounts to approximately $8,500,000,000 a year. This means a toll of nearly 15 per cent from the national annual income. Ten years ago all taxation amounted to only $2,229,000,000, approximating only 6.4 per cent of the national income. The per capita burden is $76.00 or $380 per average family of five.

A study made recently by the U. S. Department of Agriculture shows that taxes on farm lands have more than doubled within ten years. Likewise, the railroads today are paying about three times as much taxes as they did ten years ago—payments that ultimately are absorbed in charges for service as certainly as are any other costs.

In fact, very few persons now contend that the costs even of the high surtaxes on large incomes necessarily must be borne by those who nominally pay them. For persons enjoying those incomes easily can transfer the sources thereof to tax-exempt securities and thus evade all taxation. Thus, instead of facilitating more even distribution of wealth, the income tax has deflected billions of capital from industrial enterprise into the "frozen" channels of the public security, and actually has increased the volume of wealth which pays no taxes at all.

Commonly, however, say persons who have had to do with administering the law, the income taxes are "passed on" to the general public like any other charges. If such were not the case, those wealthy localities, like New York City, Chicago and Boston, from which come the bulk of the Federal income taxes, would become poorer while districts which apparently pay little of them would become correspondingly richer. But such plainly is not the case.

Yet because more than fifty per cent of the Federal income taxes come from four States and are paid, nominally, by only a comparatively few thousand super-wealth persons

and large corporations, the bulk of the funds thus derived has the appearance of being "easy money." This has accelerated the increase of expenditures on the part of the Federal Government and, indirectly, virtually all units of government.

That the income tax has abetted waste and extravagance on the part of government—certainly insofar as those evils run along with expenditures, which generally they do —is beyond question.

That the inquisitorial factors of its administration have been all and worse than its opponents predicted is evident to virtually anyone who has filled out a Federal income tax blank.

In providing funds for the expenses thereof, it also has given great acceleration to governmental meddling in other directions.

It possibly hasn't yet produced "a nation of liars" as was predicted. But this is largely because of the inquisitorial extremes to which administration of the tax goes. There, however, are admittedly millions of persons who in the past have not complied with the law even to the extent of filling out returns. These, however, in the main are confined to persons of small incomes, for which it profits the government very little to pursue.

To recite these facts may seem to be in the nature of a futile begging of the question; for whatever faults it may have developed, the Federal income tax now is necessary probably as a revenue measure only. This necessity, however, is largely because of the augmentation of government, facilitated by if not on account of, this source of easy revenue.

What the facts should teach is the importance of more careful examinations being made of proposed extensions of governmental prerogatives. Rarely has an amendment to the Federal Constitution worked out in the way that advocates of the change or addition predicted. And the Sixteenth Amendment clearly is no exception to the more or less general rule.

Uncle Sam—Pawnbroker.

"It is really not a far cry from these Federal farm loan banks to the governmental pawnshops maintained for the poor by France and Mexico," wrote Henry Litchfield West in "Federal Power: Its Growth and Necessity," published several years ago. What he contended was that once the Federal Government went into the lending business, as it had done, it probably would be only a matter of time and natural progression before it would be operating loan agencies for everybody.

The farm credit act passed during the closing days of the late Congress shows that the expected evolution is underway. The farm loan bank act was to help the tenant class to become farm owners. In the main, it merely has helped land owners to acquire more land or to procure cheap loans on what they already had. Even at that it has released only a negligible percentage of the funds that since have gone into farm land mortgages. Thus the bulk of the farmers are taxed for the benefits derived through the land banks by a comparatively small number of their own class. Partly on account of the land banks the bulk of the farmers have to pay higher interest rates on mortgage loans secured from private sources. That the problem of tenancy is now merely a historical equation in the premises is shown by the fact that the new credit act raises the loan limit of the land banks from $10,000 to $25,000—great help that will be to the average "small" farmer whether tenant or owner!

The ostensible purpose of the new act is to provide ready funds for loans to farmers on farm products. It sets up what is tantamount to a new governmental lending establishment, though operations will be through the Federal Land banks, the direct lending agencies being farm credit corporations.

What the Government does, as in the case of the land banks, is to lend its credit more than to lend public funds, but in the end the effect is the same. It is a new adventure into the realm of pawnbroking. The majority of the farmers, and others, will be taxed on account of special benefits rendered to probably only a very small percentage of all. As with other measures of that kind the relief given to agriculture no doubt will be more apparent than real.

It is another step in the direction of the kind of "State capitalism" which some students say is being evolved by Soviet Russia out of the collapse of communism.

Intangibles in Manufacturing.

The financial executive or the selling organization of a mill, no matter how efficient, cannot take an inferior product to market with success—at the same time, the most capable superintendent or other type of operating executive is often handicapped by conditions which lie beyond his ability to correct, conditions which may determine the success or failure of a mill and its product.

That the financial executive has a definite responsibility in the solution of these intangible influences, that he must give consideration to the mill, its actual operation, and the conditions affecting it, will be part of the theme of a new feature in COTTON, entitled, "Intangibles In Manufacturing," by Frederick H. McDonald, which is inaugurated in this issue, on page 551.

STATEMENT

of the ownership, management, circulation, etc., required by the act of Congress of August 24, 1912, of COTTON, published monthly at Dalton, Ga., for April 1st, 1923.

State of Georgia, County of Fulton.

Before me, a Notary Public in and for the State and County aforesaid, personally appeared W. J. Rooke, who, having been duly sworn according to law, deposes and says that he is the Business Manager of COTTON, and that the following is to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are Publisher, W. R. C. Smith Publishing Co., Atlanta, Ga.; Editor, L. L. Arnold, Atlanta, Ga.; Business Manager, W. J. Rooke, Atlanta, Ga.

2. That the owners are: W. R. C. Smith, Atlanta, Ga.; E. P. Smith, Atlanta, Ga.; W. S. Cushion, Cleveland, O.; O. A. Sharpless, Atlanta, Ga.; J. C. Martin, Atlanta, Ga.; H. H. Kelley, Atlanta, Ga.; W. J. Rooke, Atlanta, Ga.; T. W McAllister, Atlanta, Ga.; L. L. Arnold, Atlanta, Ga.; W. O. Rogers, Atlanta, Ga.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, montgages, or any other security holders are: None.

4. That the two paragraphs next above giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders, and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bonafide owner; and that affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. W. J. ROOKE, Bus. Mgr.

Sworn to and subscribed before me this 23rd day of March, 1923.

(Seal) JOHN C. MARTIN,
Notary Public.

My commission expires June 20, 1924.

What Do You Know About Labor Turnover?

BY LUTHER H. HODGES, EDUCATIONAL DIRECTOR,
CAROLINA COTTON AND WOOLEN MILLS COMPANY.

(The first section of this article appeared in the April number. In it the author discussed the meaning of labor turnover, how it is figured, what it costs, who causes it, and how to begin to intelligently combat the problem. He also began in that section a description of the methods used at the plants of the Carolina Cotton and Woolen Mills Company, illustrating his remarks by some of the forms used. New subscribers to COTTON, who may wish to secure the first section, will have their requests granted as long as copies are available.—EDITOR.)

Raises and Transfers Noted.

When an employee is raised, promoted, changed or transferred, the fact is noted on a pink card Fig. 4, and forwarded to the Personnel Office where the transfer is made to the permanent form already mentioned (See Fig. 2 in April COTTON.) A very important card, noted as Fig. 5, is called "Notice of termination of employment." This card is made out whenever a person leaves the employ of the company, just as soon as the foreman learns that the man has gone and finds out why he has left. (At the beginning of the system lots of cards came in without any reason being stated by the foremen but this condition has improved).

NOTICE OF TRANSFER-RAISE

Name .....

Plant ..... Dept. .....

Above employee has been transferred to:

Dept. ..... As ..... Date .....

Reason for transfer .....

.....

Raised from ..... to ..... Date .....

Reason & Remarks .....

Signed ..... Approved .....
Foreman Superintendent

Fig. 4. A Pink Card 3 x 5 Inches in Size for Noting Transfers or Raises.

When the card is sent in, the foreman signs the card and it, just like all the other cards, goes to the desk of the superintendent where it is approved and forwarded to the Personnel Department. When this card is received, the card Fig. 1, in the alphabetical file is transferred to the "dead" group and a proper entry is made on the permanent record Fig. 2. This card, Fig. 5, is then filed after further notation has been made on a weekly report showing turnover and reasons for leaving. This report, which will be discussed next, goes to each mill each week.

Weekly Turnover Reports to all Mills.

Each week, the separate plants get a copy of the turnover record for their plant, shown by departments, and this turnover report is listed by reasons and dates, with the turnover percentage figured for that particular week, on the basis of a year's period. The superintendent gets an admirable chance to take these reports up with the foreman and discuss the records from week to week. Listed on this same sheet with the turnover record are the records of employment, raises, transfers, etc., which gives the plant a complete recapitulation of its activities that week. This report, which is noted here as Fig. 6, is appreciated a great deal by the several plants.

The Weekly Turnover Analysis.

Besides the weekly turnover report (a copy of which for all the plants goes to the general manager's office) there is made up by the personnel manager of a "recap" sheet which analyzes the whole turnover problem for that week. This analysis is worth listing below to show directly the definite, worth-while information which is secured. The studies are made from the records of all those who have been dropped during the period. A typical week, Jan. 27, 1923, is given herewith as an illustration. These figures were taken from

NOTICE OF TERMINATION OF EMPLOYMENT 1-21-22—3m

Name .....

Plant ..... Dept. .....

Resigned ( ) Reason for leaving .....
Laid Off ( ) .....
Discharged ( ) .....
Notice ( ) .....

To take effect ..... Would you re-hire? .....

Desirable for employment elsewhere with Co.? .....

Signed ..... Approved .....
Foreman Superintendent

Fig. 5. A Blue Card 3 x 5 Inches in Size, Showing Termination of Employment. It is from this Card that the Turnover is Figured.

the "Interview" record card and in the cases where totals do not quite agree, it is because the card was not wholly completed:

SEX		
	Male	26
	Female	26
CONJUGAL CONDITION:		
	Single	17
	Married	24
	Separated-Divorced	4
ECONOMIC CONDITION:		
	Independent	19
	Helps Support:	
	One or more	13
	One dependent	6
	2 or more dependents	6
LIVING CONDITIONS:		
	Own home	0
	Rent	9
	Board	19
	Live with relatives	12
EDUCATION:		
	Illiterate	5
	Semi-illiterate	10
	4th to 7th grade	19
	High school and over	3
EMPLOYMENT RECORD:		
	New employee	13
	Re-hired	30
	3rd employment	9

The everlasting question, "Why did they leave" is partly answered in the accompanying table. And these are expressed with reasons according to length of service which serves as a cross check.

Reason	Less than 3 months	3 months to 1 year	Over 1 year	Total
Laid off (does not count as turnover)	3	0	1	4
Sickness of self	0	1	2	3
Sickness in family	1	0	0	1
Keep house	5	4	0	9
To farm	1	1	0	2
"Going home"	1	1	1	3
Better job	0	1	2	3
Living conditions	0	0	0	0
Working conditions corrected	0	0	1	1
Dissatisfied	1	0	1	2
Inefficiency	1	0	1	2
"Just a change"	0	0	0	0
To go to school	2	0	0	2
Miscellaneous	2	2	2	6
Discharged	2	1	1	4
No significant reason	11	1	2	14
Total	28	13	11	52

The analysis given in the tables is, of course given also for different periods (by quarters and years) and the facts are thereby more reliable and more informing.

Interesting Facts Disclosed.

It is an accepted fact that an organization that knows its employed personnel can more intelligently work at its problems. The facts which this system discloses are quite interesting and are used. Facts like these could likewise be used elsewhere by any live manager. Frankly, if nothing was achieved in the organization except a sustained interest in labor turnover and employment problems, it would easily be worth while. Since 1920 the foremen and superintendents of the Carolina Cotton & Woolen Mills Co. have been talking labor turnover and studying how to reduce their own labor turnover and they are doing it, according to all the records.

Besides the periodic analysis of the turnover, studies and reports are made which are given to the manager and which, in this case, are passed on to all the foremen and superintendents at regular meetings of the Carolina Cooperative Council (a very live foreman's club). This group discusses various employment problems and hear production and personnel reports about once a quarter, as well as hearing inspirational addresses once each month. As already mentioned certain studies and reports are periodically made up for the manager and I give below several sketches of these.

SOURCE OF SKILL.

Plant Number	Number of Employees Trained Here	Per Cent Trained Here	Number Trained in Other Mills	Trained in Other Kinds of Work	Total Number of Employees
1	236	93	15	3	254
2	136	92.5	11	0	147
3	260	82	57	0	317
etc.	—	—	—	—	—
Total	1,900	75.5			2,500

Here is a chart on living conditions—a vital factor in turnover:

Plant Number	Own Home Col.	Own Home White	Rent	Board	Live with Relatives	Total Employees
1	8	28	82	54	74	246
2	10	13	31	32	59	145
3	1	37	126	35	120	319
4	0	26	74	40	82	222
5	6	16	117	79	66	284
etc.	—	—	—	—	—	—

Percentages are worked out from the foregoing figures and certain conclusions drawn and followed up.

Another interesting chart that was made up showed by mills and total the length of service of all the employees. These figures were sub-divided on the basis of 1 to 2 years; 2 to 3 years; 3 to 5 years; 5 to 10 years; 10 to 15 years, and 15 years and over.

It was found that 8 per cent had worked for more than 15 years in the service of the company and that only 16 per cent of the group had worked less than one year for the company in their total employment. This latter figure runs higher of course if continuous employment is considered. It is mentioned elsewhere in this article that 34 per cent of the total force worked less than one year continuously. It has been said you can hold an employee if he works for you at least one year, but that aphorism does not always work out.

A chart was recently made up showing the extent of education of the employees and it proved to be very interesting and helpful and was indeed an eye-opener. The matter of illiteracy was brought to the attention of the Educational Director of the mills who put on a concentrated campaign for adult illiterates and five classes were started to help wipe out the illiteracy percentage. That is just one of the many instances that can be cited where the figures dug out of records can be used effectively.

From findings in the personnel department the Company is now running in its plant newspaper pictures and personal histories of more than a score of employees who have been in service continuously for at least twenty years. There are many things to be written and only a few of the usages and aids have been touched upon. The whole thing revolves about labor turnover itself and that is the chief study. Accurate figures have been kept for The Carolina Cotton & Woolen Mills Co. since 1918. In the year 1919 the conditions for labor stability were the worst and the turnover for this particular group of mills ranged around 200 per cent for the year. Since that time it has been cut down until this last year it was less than 75 per cent. At the same time in 1922 in several other mills in North Carolina the turnover ran from 100 per cent to 175 per cent *and this* in a year that was supposed to be stable. One of the best mills in the south, that has an employment department and all the other things that go with it, had a labor turnover of more than 100 per cent this past year and the employment manager said he would be ready to give up his job when he had cut down their turnover to 25 per cent (so would others). Now the question is—what is a reasonable turnover percentage for a southern textile plant? Is it as low as 25 per cent or should we be satisfied with any figure if it's under 100 per cent?

How Can It Be Reduced?

The thing that is most interesting in this whole discus-

EMPLOYMENT AND LABOR TURNOVER SHEET

WEEK ENDING..... 192.....

Name of Employee	Date Employed	Department	Dropped—Reason	Date of Raise Or Transfer
	Total Emp'd.....		Total Droppea.....	Total R.....& T.....

List below by department number Dropped (as turnover) and give reason

Dept.	No. Disch'd	No. Resigned	No. Other Causes	Total
				Per Cent.....

Total dropped as turnover.....

Reduction of force..... Total Dropped..... Signed.....

Per cent last week..... Per cent this week..... Per cent for Co. this wk.....

Per cent yearly rate.....

Fig. 6. Employment and Labor Turnover Sheet, Size 13 x 8½ Inches.

sion is—how can turnover be reduced? There are so many contributing factors toward reducing the labor turnover of any plant that it would mean a review of all its methods and practices before we could make a complete statement, however, we can briefly tell some of the things that cause the turnover and perhaps get at it in that way.

We can say without fear of contradiction that it is not always the fault of the operatives that the turnover occurs. Many duties devolve upon the management in holding down turnover in a plant. For instance, the management must pay wages as consistent as possible with the job to be done and the wages must be at least standard. A recent analysis of pay roll figures for several mills disclosed some glaring differences in wages paid on certain standard jobs. There was a difference of 25 to 33⅓ per cent for the same job, even though the total average wages for the several plants were nearly together. There is, therefore, a good chance for a high percentage of labor turnover because operatives get disgruntled at the rate of pay.

Working conditions must be attractive to new employees from the standpoint of health and safety. If a new employee finds things unpleasant you may be sure he will not stay long. The management can and must provide proper sanitation, good ventilation, safety devices and the like. There is also the matter of supervision on the part of foremen and others responsible. The organization must be efficient, well managed, and run on a business like basis; for poor supervision breeds poor workmanship, slovenly habits

and slipshod methods on the part of the operatives. There is no gainsaying the fact that an employee really likes a strict, up-to-date plant and the ability and personnel of the management reflects itself in the type and activity of the employees and in the general condition of the plant. If the management is up-to-date, constructive and far seeing, the results will be seen in the improved quality of production and a more efficient, stable personnel.

The management should have a constructive policy and should make the employees feel that they are being treated right. This spirit can be gotten across through the foremen and other key men.

Other Contributing Causes.

The management is responsible for the general surroundings, the wages, the working conditions and the policy already mentioned. However, the worker himself is often responsible for labor turnover. That is, he is constitutionally a "turnover." Opinions vary on this point but no doubt the character of the individual and his education and training have a great deal to do with his unrest and consequent moving about from job to job. Some employees are just naturally opposed to steadiness and efficiency. Operatives, so many of them, are also so darn sensitive that they are unwilling to be corrected or told what they should do. If reprimanded they get sore and quit. This type of fellow can be kept out of a plant if a record system is kept and its plan enforced. (There is current talk among some important mills of giving a credential card to all those employees who leave the mill and who deserve a recommendation. This would help clear up the situation).

There are so called inevitable terminations due to accidents, sickness, death, etc., and many employees leave a plant because they are afraid of these things even though they are not directly affected. Family connections also count largely in the labor turnover percentage and the variations of this reason for terminations are indeed difficult to tabulate. One member of the family may not like the town in which he works and he, therefore, influences another member to leave. Some member gets in wrong with the foreman and is discharged or quits, and the mill will no doubt lose other employees who are good workers yet who have family connections. A good foreman will consider all these things in running his department. In Spray, North Carolina, recently a man left town with a large family of boys, some of whom were old enough to work, because of the fact that one of his younger boys was made to go to school. This brings up another much mooted question—to what extent should the mill and mill officials be interested in the things that happen in the community?

Use Your Records—Choose Good Operatives.

If you have records of your operatives use these records. But in the first place always choose as good operatives as can be found. It is interesting to note that the multitude of foremen still believe that they should hire just anybody that comes along if they have a machine standing. Is the foreman right in hiring the first fellow, or should he leave the machine idle until he has had an opportunity to make a proper selection? Indiscriminate hiring and placing of help serves to increase the turnover percentage and enlightened foremen are continually studying ways and means for increasing their own knowledge and efficiency with respect to hiring and placement of help.

Establishing Working Relations.

After the foreman has chosen his man and placed him on the right job he should try to make him feel at home and treat him as a friend. He should explain the work to him, tell him about the Company as far as circumstances permit, tell him about the community and the people. Cordial relations should be established between the new man and the older employees and he should be made to feel that he is a part of the working team.

Some foremen think they never have any further responsibilities after they have given a man a job except to see that he stays on that job. If the foreman starts the man right on the right job and treats him square from then on, he has already begun to reduce labor turnover.

Plant Policies and Practices.

There are certain influences which reduce job changing that are not found in the department itself. These influences take the form of plant policies and practices that affect every department in the mill. Very few people like to be encompassed about with rules and regulations and there is a natural rebellion against rules posted in the department. Some companies pass on rules and regulations to their foremen which makes it very difficult for the foremen to get the best results out of his department. It ought to be so that a person can be made to feel at ease and yet have proper respect and interest in the policies in the Company.

Specific Points.

Go to your foremen with facts and figures about the things that are causing labor turnover and make plans with him for combatting the problem. If the superintendent or manager will talk over these matters frankly with the foremen and second hands, a great deal of good can be accomplished. Practically every man likes to improve himself and get ahead and the average mill could, by establishing educational classes, not only hold its operatives, but in the holding of them make them better operatives. And, by the way, an intelligently worked out educational program not only furnishes a dandy opportunity to develop operatives for better jobs but helps also to put across management ideas.

Foreman conferences and special classes, especially on employment, establish a spirit of cooperation through a forum discussion and furnishes an opportunity for all ideas to be pooled. If space permitted many practical instances of this could be given.

The plant newspaper is a good medium to put across stabilizing messages. And of course there are many things such as group insurance, profit sharing, employee representation, etc., that are suggested but these things are not always acceptable or practical. Nothing in this article is offered that cannot be put on by the most conservative mills and if vigorously followed up can be made very helpful.

To Recap Our Suggestions.

1. Mills should intensify their study of the labor turnover problems.
2. Should learn what turnover is.
3. Should learn what turnover means to their particular plant.
4. Should find out how it is figured.
5. Should try to ascertain how much it costs them.
6. Should know who causes the turnover by establishing some fact-finding system.
7. Should make this system practical and workable.

8. Should use the figures secured.
9. Should encourage making reports and analyses.
10. Should make definite plans to reduce turnover.
11. Management should review its duties.
12. Contributing causes should be studied.
13. Education of a practical sort for operatives and the foremen should be instituted.
14. The problem should be continually fought.

It is a big problem and hard to discuss briefly. An attempt to awaken interest in this vital problem that is sapping our efficiency and costing us money is the excuse for this article. We need to study more in this textile industry from the general manager on down. COTTON is doing its part by writing articles and discussion and making suggestions through its valuable columns. We hope others will be interested.

Spinners Meet at Spartanburg

Continuing the plan of the Association for the conduct of practical discussion, the Spinning Division of the Southern Textile Association held its third discussion meeting at Spartanburg, S. C., on Friday, April 6th, considering questions relating to the spinning, spooling and warping departments.

Carl R. Harris, night superintendent of Mills No. 1 and No. 3 of the Lancaster Cotton Mills, Lancaster, S. C., presided at the meeting in his capacity as chairman of the Spinning Division, and conducted the discussion in an able manner, keeping the meeting going at all times in a snappy, efficient way.

A representative attendance of operating executives of the southern mills was present, and besides the discussion itself, features of the meeting included three brief papers read by members, and the reading of results of tests by Chairman Harris which had been conducted by various members. At the second spinners' meeting in Gastonia in 1921, the question of variation of yarn numbers was brought up for some lively discussion, and as a result, the men were requested to make, on their return home, tests by sizing every bobbin from the side of a frame to determine the actual variations in their yarns. Just prior to the Spartanburg meeting, a blank for this purpose was sent out by the committee, and the results of the tests, as reported, were announced by the chairman at the meeting, and proved most interesting. These figures are included in the report of the proceedings as given in the following paragraphs.

One feature which must not be overlooked, because it was a definite indication of the development of the discussion meeting idea, was the fact that only a very small proportion of the list of questions previously prepared for the meeting were taken up; not that the men weren't interested in them, but they came with questions of their own and submitted them to the body of mill men for discussion and possible solution. It was hardly necessary, during the discussion, for the chairman to bring up a question, because the men themselves were at once ready with problems from their own experience.

Another very noticeable feature developing at this meeting was the fact that more and more the discussion is being participated in by new men, that is, by those who were more or less reticent when the discussion meetings were in the stages of earlier development. With this feature emphasizing itself with each meeting as it is held, the possibilities of what can be accomplished as a result of this increasing interest can hardly be foretold.

Now the reporter will cease talking and we will get into the meeting itself. It consisted of the usual morning and afternoon session, with a "Dutch" luncheon between times.

The Morning Session.

was opened in the Chamber of Commerce Hall at 10:15 o'clock by Chairman Harris. The delegates rose while prayer was offered by W. A. Black, superintendent of the Beaumont Mill, Spartanburg, after which the meeting went into the discussion feature. In opening the discussion, Mr. Harris said: "It is a real pleasure to meet with you here today. It feels like a reunion, as we held our first spinners' meeting here in Spartanburg, and I notice quite a few men present who were here at that time and helped in the initial launching of this work.

CARL R. HARRIS, CHAIRMAN OF THE SPINNING DIVISION.

"With regard to these meetings, I am reminded of a story about an old negro when I think of the results of this kind of meeting. This old negro was charged with stealing a pig, and was brought into court to be tried. As it happened, this negro was an employee of a prominent member of the local bar, whose services the darkey secured to defend him. The lawyer's argument resulted in an acquital for the darkey, and after it was all over the lawyer asked him, 'Now, Mose, come on and tell me the honest truth; did you steal that pig or didn't you?' 'Well, boss, I'll tell you,' hesitatingly replied Mose. 'Before the trial started I thought I'd stole that pig, but after hearing you make that flowery talk about me being innocent, I'm beginning to doubt myself whether I did do it or not.'

"That's the way I feel about the sectional meetings," said Mr. Harris. "Until we started them I felt I knew a

good deal about my business, but on attending these meetings and hearing the different men discuss their problems, I've about decided that I didn't know as much about it as I thought I did. It has been a very liberal education to me, and I trust that some others have gotten as much good as I have.

"None of us has reached the stage of perfection, because that is not attainable for man or machine, but by getting together and discussing our problems we can make wonderful strides forward; there is no limit to the good we can do each other and the industry as a whole. Did you ever stop to think that in this room there is a group of successful men, and if it would be possible for one man to acquire all the knowledge and experience represented here, he would be an Edison of the textile industry?

"It was very gratifying to me to notice the interest taken in the letter I mailed out requesting that members send in questions to be discussed here, and also in the letter that Mr. Clark sent out for yarn tests. That has proven to me that a greater interest is being taken in this work, and if you could see the reports as I have seen them, you would realize that we are doing something. And I wish to take this occasion to thank you for your hearty cooperation in this work."

Mr. Harris then announced that the committee had arranged for three short talks to be made at the meeting, covering the subjects of "Management of Help," "Mechanical Upkeep of Machinery," and "Spooling and Warping." He said, "we appointed a man for each of these subjects, to prepare a paper to be read at this meeting, and then we will take up these papers and discuss the points brought out. The men appointed to this work have shown the finest spirit of cooperation and willingness to help out in every way possible, and I know you will be interested in what they have to say."

The first speaker presented by Mr. Harris was John D. MacAuley, foreman of spinning, Standard-Coosa-Thatcher Company, Piedmont, Alabama, who spoke on the subject.

"Management of Help."

Mr. MacAuley, speaking from an experience of over thirty years as foreman in the spinning room, said:

"The secret of management of the help depends largely upon a good knowledge of human nature, and it has been said that a foreman of spinning is a teacher, judge and juror all in one, as he has to teach the help, lead and advise them in the right way, and settle their difficulties.

"As the spinning room is the starting place for all young help, who shall later become the men and women workers in the cotton mill, I would say that a foreman should be a Christian, as he is a leader of the younger help in the mill and it has been said that to be a successful foreman you must treat the help as you would want to be treated, should you be in their place.

"I find that the most successful way is to have a system in the management of the room or department. Now in regard to hiring the help, it should always, if possible, be done by the foreman, and in hiring he should do so with the idea that they may work and be advanced to the highest place in the room when they deserve the promotion, if there is an opening.

"In regard to human nature, all boys and girls have different temperaments, and we find that some, in being taken on, make better spoolers, while some just make spinners all their lives. I have made it quite a practice in hiring help to make a study of them and put them in the places they fit best. I have never been very successful with boy spinners, except to teach them to spin before putting them on doffing. I believe girls make the best spinners, being quick to learn to piece up ends and they take more pains in their work.

"I have been very successful with boys on doffing, and advancing them from spinning to the twisting room, and teaching them to be fixers and second hands.

"Running a spinning room is not the easiest thing in the world, but with constant attention to all the small details, as well as to the larger ones, it can be run very satisfactorily. Let yourselves be satisfied with nothing less than the very best yarn that can be made.

"Now a few words in regard to my system in the line of promotion. After a spinner has had time to learn, I start her with one to two sides, then as she gets better she advances to twelve sides, which is the most my best spinners run on 50s to 80s yarn. I am now insisting and teaching all my spinners to twist up all their ends instead of 'dabing' them up. I have my rooms graded, boys learning to doff are put on the easiest set, then on a set a little harder, and on up. Twister doffers I teach to be twister tenders. Then run from ten to eighteen sides, wet twist. The same system works throughout the spooler room..

"So much in regard to the management of the help and their duties. I will now say a few words with regard to the way to get the cooperation of the help.

"The foreman, assistant foreman and fixers should be ever on the lookout to see that the machines are kept up in first-class shape, such as oiling at the proper time, rings and travelers changed when worn, and renewed when worn out. I find that when the machines or spinning frames are kept in good order and the work runs good, we have very little trouble in managing the help.

"I find that the hank clock on the spinning frames has been a great improvement and aid to the foreman in managing the help. In other words a spinner takes more interest in her work when she knows she is getting paid for all the pounds she turns off, instead of keeping or running so many ends to the side, and they help the foreman to keep their frames running, knowing that when they are stopped they are losing out.

"I am a great believer in the check system, such as having different colors for different numbers, spools and bobbins. Also, marking the sides and giving each spooler a number so that when they make bad work it can be traced to the one who made it.

"In closing, I cannot help but add a few words from *Forbes Magazine* of February 17, from an article written by Harry H. Tukey, entitled, "The Key Man of Industry:" The foreman and the minor executives, whether the workers under them are turning out the production, distributing it, attending to its finance, or keeping office records, are brothers. They are the stuff of which leaders are made. Every man who has a dozen or more workers under him must solve some of the same problems that beset the larger executives, and the principles are the same in the shop, office and elsewhere, only their application varies since the foreman is only a step removed from the mass of workers and very close to them in sympathy. The connecting link between management and men; he has been called the key man of industry. If we are to have closer cooperation between employers and

employees, more wholesouled team work all down the line, we must have more intelligent foremanship.

"Should a foreman be especially trained for his job, or should he simply be launched unprepared, to sink or swim? What are the duties and responsibilities of the foreman? How may he school himself to discharge his duties and meet his responsibilities? I would say in reply, a foreman should be trained and prepared. Now, referring to my position, my assistant foreman is in training now and while I am here he is in my place and the work and production is going on just the same.

"In regard to the training, we have different textile schools. also numbers of textile books and scores of foremen who are always willing to lend a helping hand to any young man who is willing to study and learn to manage a spinning room."

When the meeting was thrown open for discussion of Mr. MacAuley's paper, James A. Chapman, Jr., vice president of the Association, and superintendent and vice president of the Inman Mills, Inman, S. C., asked Mr. MacAuley: "Have you had any experience in having a certain worker do all the training of help?"

"Yes," replied Mr. MacAuley, "I am working on that now." "Do you think they learn faster?" asked Mr. Chapman, adding that he is considering doing it himself.

Mr. MacAuley, replying that he does believe the help learn faster, continued, "I have one of my best spinners do this work. We take a learner and put this spinner with her to teach her, and pay her a little extra for doing this. We have been running this system for a little over a year now, and it has turned out very satisfactorily.

"We very seldom get in any experienced help; we have to teach most of ours. I have tried the old method and really believe this is much more satisfactory. I put this good spinner with a girl and she stays with her until she can run a frame. In the old system of putting a new girl with somebody she knows, maybe she will get along all right for a while, but she will eventually get into a rut."

L. R. Gilbert, superintendent, Caraleigh Mills Co., Raleigh, N. C., at this point made this request, "I want to find out how many foremen want to teach anybody to spin?" Counting the hands that went up, Mr. Gilbert continued. "Um, about a half dozen; that runs true to form." "How many have tried using a special trainer for teaching?" was Mr. Gilbert's next question, to which about six replied in the affirmative. "Now," continued Mr. Gilbert. "I am going to say that if I can put it over I am going to do it. I have been trying to get somebody who will have nothing to do but train. It takes a long time to teach a spinner, and I believe it can be done in one-fourth the time with a trained spinner to take a girl and teach her to spin. I wish you would try it out and report at the next meeting."

"I would like to say that that is my idea," agreed Mr. MacAuley. "If you have a girl on twelve sides she doesn't have much time to teach the learner. Our present plan is to just put her on one side and get her to where she has to piece up ends and do what cleaning she has to do, and then devote as much time as possible to the learner."

Mr. Harris said that it has been his experience that "though it is some trouble, when you take green help and teach them you have something that is worthwhile, and a set of help who will stay with you. On my job I would rather let the machinery stand until I could take green help and train them to spin than to hire trained help from another mill, because when you get the green ones trained you will have them for good."

The chairman asked for further discussion and Mr. Gilbert put this question, "This may be irrelevant, but I would like to know what you fellows pay your learners; about what do you pay them?"

Mr. MacAuley said, "We start ours at 7½ cents per hour." L. E. Wofford, overseer spinning, Inman Mills, said they pay theirs ten cents on day and night; another man indicated he is paying five cents an hour.

"I would like to ask how many sides this lady that is teaching spinners at Mr. MacAuley's mill is running," said C. B. Gunn, superintendent, Spray Cotton Mills, Spray, N. C. "Does she run twelve sides and teach, or does she run six or four sides and teach?"

"This young lady is one of the best spinners I have," replied Mr. MacAuley, "and she is running twelve sides. But this is not satisfactory, and I am now working on a plan to take her off the job and put her with the learner on only one side, if it takes one week or two weeks, until she learns."

"Are you teaching them to twist up the ends?" asked Mr. Gunn.

"Yes sir," was Mr. MacAuley's reply. "In Piedmont and at Chattanooga—where our main plant and mercerizing plant is located—we are using the McColl guide, and we find a 'dabed' end strikes the teeth and breaks down. A twisted end comes through all right, but we made tests twice a week and found that the 'dabed' end strikes the teeth of the McColl guide and will not come through."

Discussion on Hank Clocks.

At this point the discussion was turned to the subject of hank clocks on spinning frames and twisters. "Mr. MacAuley intimated that he had put on hank clocks," said Mr. Chapman. "I would like to get the experiences of some of the men here who have tried them out, as to what benefits are derived from them. I am using them myself, and I want to know how to keep out of trouble."

Responding to this request from Mr. Chapman, Mr. MacAuley was very high in his commendation of the usefulness of the hank clock. He pointed out that "when you are running sides, they work from whistle to whistle," adding that with the hank clock method of payment, the spinners give more attention to their work and strive to turn off more production because they realize that they are getting paid more in proportion to increased production from their frames.

He related an experience of a girl running eleven sides who had a habit of coming in late nearly every morning, allowing the fixer to start up her machines for her. After installing the hank clocks, Mr. MacAuley said, he instructed the fixer to not do this, and when pay day came around the eleven-side spinner found that another spinner running only ten sides had made 35 cents more than she had made. She raised the question "Why?" and upon having the proposition explained to her, she stopped being tardy. Mr. MacAuley said he pays the spinners by the hank and that the doffers wages are determined upon a percentage basis, thus giving them an incentive to increased energy, as they realize their wages will be larger in proportion as the frames turn off more yarn.

"We can also detect slipping belts by using the clocks,"

continued Mr. MacAuley. "If a belt is slipping we will have two frames turning off different amounts; or we find that one frame has been stopped longer than it should have been.

"We have not carried this proposition as far as we want to, because some time we want to put the fixers on piece work, too."

"We are very much interested in the hank clock, pro and con," said B. R. Burnham, superintendent, Whitney (S. C.) Manufacturing Company, and chairman of the Association's carding division, "but I do not believe they should be introduced as a 'cure-all' or a method for overcoming the weaknesses of the overseer and second hand, in getting help at work on time, for instance."

"Mr. Brigman has put 116,000 spindles on hank clocks. Can you give us a few of the things you ran up against?" suggested Chairman Harris.

"There are a good many things that you run into in putting on hank clocks," responded Mr. Brigman, who is general overseer of spinning at the Lancaster Cotton Mills. "In a room of 264 frames I just started them on 50 frames to begin with, and took these spinners and put them on frames instead of sides. We put on those frames and then put on 50 more next week, and so on, until we had put on the balance of the 264 frames. That's how fast we got them on.

"Figuring on production—I don't expect that all of you will believe what I say—figuring our production since we put on the hank clocks, from the speed of the front roll and the hank clocks, we never got under 105 per cent, but, now, from the time that the yarn made goes to the beam, you will find a percentage of loss in there, because of ends down, bands off, tapes off, or something of that kind, of about three per cent. Before we put on the hank clocks the spinners would stop the frames to clean off travelers, rings, etc., but now we don't have anything like that. Now we can hardly make them stop the frames. In fact we have a good many kicks from the weavers that the filling is too full. I attribute all of our better results to the hank clocks.

"The only trouble is in getting started; my advice is to start off slowly and do not go too fast, but after you get it started you will find that you will like it. We told our spinners and doffers about the pay; that we were going to see that they got as much pay as before; that their pay should not be cut; 'we think we are going to materially raise your pay,' we said, and after we put on the clocks they are making from one to two dollars more, as a fact."

"Mr. Brigman, does it reduce the cost or increase it?" asked Mr. Gunn of Spray.

"It reduces the cost, sir," replied Mr. Brigman.

"I would like to ask Mr. Brigman another question,--said the chairman. "You had the clocks on the frames before you started paying by the clock, did you not? You kept a record before you set a rate?"

"Yes sir," said Mr. Brigman. "We put all the clocks on, but just switched over as I explained. We watched production and figured it by the hank clock before we established the rate for the spinners and doffers."

"You run through the noon hour?" asked J. V. McCombs, superintendent Buffalo (S. C.) Plant, Union-Buffalo Mills. "How do you pay them?"

"One spinner doubles up with the other," explained Mr. Brigman. "One doffer doffs sixteen frames with three spinners and they double up and let two spinners out. You cannot do this on coarse work, I don't believe, in the way I am doing it on 30s and 40s. They double up with each other, but we make them all take the hour for dinner."

"I am in trouble," admitted Mr. McCombs. "I have had hank clocks for some time; they increase production, all right, but I wrote to at least fifty cotton mills about their system of paying by the hank clocks, and didn't get any explanation at all. It's a whole lot easier to run hank clocks than to pay by them. I have been unable to get at a rate. I have 63,000 spindles, with a regular hank clock man who takes the readings." Mr. McCombs said he is not paying by the hank. He runs through the noon hour, and said if he used spare hands for this work, it would require about fifteen time keepers to keep up with the changing of help "We cannot double up," he said, "because our spinners, on our coarse numbers, have all they can handle. That's a proposition I've been unable to work out; to keep the spinning going through the noon hour and keep the clocks straight, without paying somebody for something they don't do. I wrote to the superintendent of one of the largest mills in the South about his system of paying by the hank clock, and he said he isn't doing it. I don't know why."

"I agree with you, Mr. McCombs, if you are running coarse numbers," said Chairman Harris. "I am running 4s to 8s, and am paying by the clock; however, I am running at night, and we give thirty minutes for lunch, and do not stop. Wherever it is possible we double up. If I have two spinners and a doffer working together, they double up. If you cannot do that, and you know you cannot do it altogether on 4s and 8s, because your doffer and spinner don't have the time, you have some difficulty, perhaps, but I am firmly convinced that by doing what doubling up we can do and by having one or two extra spinners, we are more than repaid for our trouble."

Mr. Gibson at this point asked how many spinners in the room were running through the noon hour. About one-third of the men present indicated they are doing this.

In response to a question from the chair, only three men who said they are on coarse numbers are using the hank clock.

Mr. Henderson, of Cordova, Ala., in responding to a request from Chairman Harris for information to assist Mr. McCombs, said he is running about 30,000 spindles, on 7s to 16s, using the hank clocks, but he doesn't pay the spinners by the hank clocks. He said, however, that he has 49 frames on 12½s, and that he pays these doffers by the hank, but has never tried this method for paying the spinners. He reported that he gets an awfully good production of pounds per spindle.

The chairman asked Mr. Henderson if he had some good reason for not paying the spinners by the hank. Mr. Henderson answered that with a spinner on ten sides, changing her over to frames would require that he split up the work, pointing out that on course work the doffer could not handle more than three frames.

George Ray, of the Brandon Duck Mill, at Greenville, said he is running 264 frames, but is not paying by the hank. Asked by Mr. Wofford if he runs at night, Mr. Ray said he has about 30 or 40 frames on night work, and explained that his method of keeping the production separately was to have a man take the reading of the clocks at the end of the day shift and then again in the morning.

"After you got the clocks in operation and increased the

production, how much did it decrease the cost per pound in the spinning?" was the next question asked by a member.

"I could not tell you exactly," responded Mr. Brigman. "But our production went up 10,000 pounds on warp and 7,000 pounds on filling, and I am sure that it materially reduced the cost per pound."

Mr. McCombs expressed the opinion that while Mr. Brigman is actually showing an increased production on the reading of his hank clocks, at the same time the actual production is not quite so high, pointing out that the contraction on 30s is about 6½ per cent, and that the reading of the hank clocks does not show the amount of contraction between the front roll and the spindle. "Where you were getting about 90 per cent you would show about 98 per cent." In basing the rates for pay by the hank clocks, this factor should be taken into consideration.

"I would like to say that we have conducted tests on this for over a year, and we found our lossage from the speed of the front roll until it comes off the warper to be about 3½ per cent," said Mr. Brigman.

"I know that when we went on the hank clocks that that was figured in for contraction," added Mr. MacAuley, "and unless I am mistaken, it was 3½ or 4 per cent. We started off and it was three and it has gone up to four, for the ends being down, etc."

Reports on Yarn Variation.

At this point the chairman took up the subject of variations in yarns. "At the Gastonia meeting, we spent considerable time on variation in yarns," he said, "and we asked you to make a test by sizing every bobbin on a frame and report on the variation in numbers. Mr. Clark has sent out a blank for the recording of these results, and I have probably a dozen here, and maybe some others of you have brought your reports with you." Mr. Harris explained his method of arriving at the figures he had to read: by taking the highest number and the lowest number and then figuring the percentage over standard and the percentage under standard.

Mr. Harris then read the results of the reports which had been sent him, which are recapitulated herewith, showing in each instance the standard number, and the highest variation in percent, above standard, the lowest under standard, and then the total variation. These results are shown in the accompanying table:

TABLE OF SPINNING VARIATION.

Standard Number	Percentage of Variation Under Standard	Percentage of Variation Over Standard	Total Variation
4s	3.73	3.25	6.98
8s	3.12	10.26	13.38
9.25s	8.42	8.1	16.52
13s	9.53	6.3	15.83
13s	7.18	6.84	14.12
14s	7.21	6.64	13.85
29.50s	13.08	14.5	27.58
30s	3.36	7.53	10.89
40s	7.4	4.17	11.57
59s	3.51	2.72	6.23
18.50s	10.5	9.6	20.1
50s	9.1	2.56	11.66
60s	5.83	7.53	13.36
10s	7.8	1.5	9.3
19.50s	9.34	5.7	15.04

Another man, reading his results, showed on 20½ warp, a variation of two per cent under standard, and 7.60 per cent over standard, a total of 9.60 per cent variation; on 17s, nine per cent under and 5 per cent over, a total of 14 per cent total variation. This was on band drive.

Taking some of the report figures up for analysis, interesting results are secured. When the report of a variation of 27.58 per cent on 29.5s yarn was read, several of the men were heard to say, "Now, there's a man who put it down just like he found it!" Considering this variation it is shown that with 29.5s as standard, on the same frame on at least one bobbin 34s yarn, approximately, was being made, while at the other extreme, 25.1s was being turned off.

After the meeting this was pointed out as a definite result of the discussion meeting plan. At the Gastonia meeting in the latter part of 1921 Mr. Chapman more or less surprised the meeting by admitting to a variation of 17.25 per cent on 41s with J. O. Edwards, now at Monroe, N. C., as superintendent of the Icemorlee Mills, agreeing that a 15 per cent variation on spinning was a very good record. However, after going into it individually, it is apparent, from a study of some of the reports, that the experiences of these men were not isolated.

A number of the men turned in their reports at this time in the discussion, and a committee consisting of Messrs. Gilbert, McCombs and Brigman was appointed to determine the percentage of variation recorded in these reports, to be read at the afternoon session.

Then, having established that the variation in numbers does exist, the chairman turned the meeting into a discussion of

"What Causes This Variation in Yarn?"

"It is needless to make an expression on this," commented Mr. Brigman, "if you will read the report of the carders' meeting in Anniston, where they were discussing the variation caused by laying down laps, uneven run-outs on the pickers, etc."

"Yes, that's true," said Chairman Harris, "but quite a lot of the variation can be caused in the room under the supervision of the spinning overseer. You take a spinning room with band drive, you will have slack bands; you won't have that condition on tape drive. Then you have bad rolls, some rolls probably larger at one end than the other, improperly selected skins, and then you will find neb bars that are not properly set up and some will have worn to where the roll works against the bar, which allows your leather roll not to be in true line with your steel roll. It isn't a hard matter to go into a spinning room and find stirrups rubbing on the steel roll, or the weight levers are not set on a level, some too low and some too high; that gives a difference in weights and you will have a different draft. And then you will find rolls with loose necks and worn stands, causing a wobbly roll, and you can't get the same sizing off the bobbins—all of these things will cause uneven yarn, but I think that one of the worst things for causing unevenness is oiling. I believe that you will get more unevenness, more bad running work, from improper oiling than from any other one thing in the spinning room, and I will say that if you will stop and figure the breakdowns that nine out of ten are due to improper oiling."

"Yes," said Mr. McCombs, "we'll agree with Mr. Harris on anything he says—," "But I don't want you to do that," objected Mr. Harris. "—but my experience," continued

Mr. McCombs, "has taught me that bad carding is one of the greatest evils for making uneven yarn." He related an experience of going to a mill that was running badly and after he got the carding straightened out the work ran much better. "That I consider the greatest evil," he said, "although there is the settings of machinery, oiling, lickers-in, and a million other things."

The second greatest evil, said Mr. McCombs, is humidity. He told of an experience only two days before the meeting, when he had his work right on standard, and that "the Lord began pouring it down," and the work "sucked it right up," and his weights went off.

Mr. Gilbert asked if "when the numbers are running heavy when it has rained, are you drawing cotton or water. I am asking for information; I have never had it answered. Do you lighten up on your stuff when it rains one day, and if you lighten up, and it gets fair and dry and windy, where do your numbers go? I do not change my work every time the weather changes."

Mr. Burnham replied that in making tests under government supervision, it was determined that it was water that the mill is getting on the humid day, and not cotton. He stated that apparently the weather acted differently in different sections on the day mentioned by Mr. McCombs, as this particular rain did not heavy up his numbers at all, on 4.00 and 5.50 sheeting.

"We all have our faults in the spinning room," Mr. Wofford said at this point, "but the most important thing in the spinning room, to my mind, is the different leathers and different cloths with which we cover the rolls. I have experimented a good deal on this and even went so far as to cover some rolls with two cloths to see what it would do to the numbers, and weighing the whole set I found it made a good deal of difference. While a whole lot of the unevenness is caused in the card room, a whole lot of it can be remedied in the spinning room by keeping eternally after the little things, seeing that the rolls are right, and saddles and stirrups properly adjusted."

Spooling and Warping.

At this point the chairman announced that the second paper on the program would be read, the subject being "Spooling and Warping." He presented L. E. Wofford, overseer of spinning, Inman (S. C.) Mills, who read the following paper on this subject:

"The spooler room has in the past been generally looked upon as one of the necessary evils to be endured in the mill. Due to this attitude it has been that, in a great many cases, only such attention as was necessary to get by on was given to this department. Often the error of such an attitude is forcibly called to our attention by a multitude of gouts, kinks, loose knots, etc., which tear up the weaving. However, it is not everywhere that such a slack attitude is taken toward spooling and we find in a majority of the more progressive mills that careful attention is given the process of spooling.

"At Inman Mills we have a second hand in charge of spooling and warping. I think that every mill large enough to justify it should have a good man in charge of this department because, although it is not one of the most important departments, it is important enough to require and justify close and proper supervision.

"A good spooler man, I would say, would be not only a man who knows his job from a mechanical standpoint, but a man who will try to study his help and get them to take more interest in their work by teaching them the fine points of their jobs. One important consideration of good work in the spooler room as well as in any other department of the mill is the proper training of help. You all know what inexperienced, green help does for you, and the difference between the quality and the quantity of their work and that of the properly trained and experienced help. The training of this help, which we all have to do, is an important factor. I think we might be well repaid for the time spent here at this session if we did nothing more than exchange ideas on training and handling our help.

"Right along this line, I think it good if we can teach our help to have a cheerful attitude toward their work and while at their work. To illustrate, I know that you all have heard of the construction gang paying one of their negroes a little more than they paid the others merely to keep the gang singing while they worked. It seems to make them work steadier and apparently they are not as tired as when they do not sing. Recently I was in the spooler room considerably more than usual, in fact I happened to be in the spooler room all day. Practically every one of the girls was singing. They sang continuously for almost the entire day and seemed to enjoy it. I noticed particularly how cheerful and industriously they seemed to be working and the next morning I asked the spooler second hand how much yarn had been spooled the previous day. He told me that he had secured a greater production on that day than on any other day for a good many months.

"Another thing which I think will help our work is cleanliness. By this I mean not only the keeping of the machines and work clean—that is very necessary—but also the keeping clean of the room and surrounding conditions in general. The results of a clean room may not be seen at once, but we know from tests and various experiences in industrial plants that clean rooms naturally make the quality and quantity of the work better. I don't think too much emphasis can be put on clean, healthful working conditions in any department of the mill, for in the final analysis I believe it will pay dividends.

"When we have our rooms clean and in good condition and our help properly trained it is necessary that we have a way to check up on them. Human nature seems to be built in such a way that it requires a continual 'staying in behind it' in order to get just what we want. At Inman we are using separate sets of spools for each spooler. In case any bad work turns up we know just who spooled the yarn and can easily go back and lay the blame where it belongs and correct the difficulty. We are not running our spooling at night but in case we should have to do so we would have a different set of spools for the night shift.

"Another important thing is the guide. I do not know what kind of a guide you are using. I would be glad to find out in the discussion to follow But I would recommend a guide which is both simple and effective. The more simple they are the easier and better they can be adjusted. The more effective they are then the less stoppage in the weave room to take out gouts and bunches, etc., and thus more production. I like a guide which is fool-proof. By that I mean one which cannot be tampered with or adjusted by the help, one that will stay set when adjusted by the regular fixer. I will not attempt to give you any rules by which to set the guides but will merely state that the guides should

be set as close as possible without chafing the yarn. This is done in order that they may break out all the gouts and slugs possible.

"At present there is considerable talk and experimenting with filling wind on warp. In case you have the filling wind then the tension devices in your spooler room must be carefully looked after. The main thing is adjusting of the tensions. All should be adjusted just alike and tight enough to make a good firm spool and to break down the unusually weak ends.

"By carefully watching the little things we can insure greater production and less waste. Anyone can see the big things—they are easy—it is the little things that we must watch closely. For instance: see that the knotters are in good condition. See that spools do not have rough ends. See that spools are not filled too full. Have an especially good hand to work up bad spools and bobbins and she can save a great deal of yarn.

"Now, in passing from spooling to warping, the same ideas as to cleanliness and training of help still apply. Of course the creels and skewers must be in good condition so as to allow the yarn to pull off easily. The drop wires on the warpers should be in good condition and kept clean. Vibrators, which will insure the falling of the drop wires, are a very good thing. I would advise blowing off the warpers only when the beam is empty. If necessary to clean the drop wires or elsewhere about the warper at other times, then stop the warper and use a brush.

"Our biggest problem and the one which causes more waste than any other thing," concluded Mr. Wofford, "are the bad run-outs at the slasher. The measuring rolls should be exactly the same size, as the smallest difference will throw us out on the amount of yarn we put on the beams. I think a coat of paint on the measuring roll helps as it does away with any or at least most of the slipping which might occur. Even with the best of conditions it is a problem to make the beams run out properly and it will require a great deal of careful watching and checking of the different warpers and the way the beams made on them run out in order to reduce the waste to the smallest degree. This is something that my boss has been on me about, and I would like to get some help on it from some of the rest of you. The floor is now open for the discussion of this or any other problem on spooling and warping that you may care to bring up. Shoot!"

Before discussion on these subjects was taken up, A. B. Carter, secretary of the Association, announced that the regular annual meeting of the Association will be held at the Battery Park Hotel, Asheville, N. C., on Friday and Saturday, June 22 and 23. Mr. Carter also urged that members not listed and members incorrectly listed in the year book of the Association, send in to him, at Gastonia, N. C., their correct addresses, so that he may complete his mailing list.

Reverting to the subject of Mr. Wofford's paper, Mr. Brigman said "I think I can help Mr. Wofford on one of his problems. You take any warper—I have done it many a time—and run a whole set on it, with the same number of ends and everything, and you will find that the unevenness is just the same. I can tell you the reason: the slasher tender runs the bearings too tight. They have had me go into the slasher room on account of uneven run-outs, and I would get down and find the bearings worn out because they were screwed up too tight. Another thing is having two sizes of barrels, so that the larger size doesn't run out before the smaller one."

"I would like to say that I have tried the same thing," agreed Mr. Wofford. "I ran three sets off one warper to go on one slasher and I made more waste with those three sets than I did with the regular sets."

"At one of the meetings we discussed the advantages to be derived from using ball bearings on the warper measuring roll," said Chairman Harris. "How many here are using them?" Three men indicated they were.

"Did it decrease your waste?" the chairman asked these men. "It cut our waste down over fifty per cent," responded Mr. Burnham. "We will not take into consideration any bad practice going on before, and I am not going to definitely say fifty per cent, but it materially decreased our waste, and we are having no trouble with them."

"While I am on my feet," continued Mr. Burnham, "I should like to ask if any of you have had any experience with a traveling electric fan for keeping drop wires on the warpers clean?"

Chairman Harris suggested that this question be held over until the discussion of the subject in hand was concluded, and called for further discussion of ball bearing measuring rolls.

Mr. McMahon, of Greenville, said that the ball bearings on his measuring rolls, "decreases our waste some, but I would not attempt to say just what percent, probably 25 or 35 per cent. We still have waste, though, it doesn't all run out together, but they run out some nearer than they did before."

Mr. Splawn, of Clinton, said his waste had been reduced approximately 25 per cent through this application of ball bearings

Mr. Wofford of Inman stated that he had only two warpers thus equipped, but that he could not reduce his waste; in fact he made more waste on the three sets previously mentioned in the discussion, he pointed out.

"While I am on my feet," continued Mr. Wofford, "I would like to ask if the men here will say what is the proper amount of waste to be made per beam, giving the number of ends, number of yarn, number of warps, etc?" Asked to give his own experience and opinion, Mr. Wofford continued, "Well, I make a right smart sometimes. But we try to hold our down to .8 pound per beam; I know some say ½ pound to the beam is good. We have 471 ends, 29½s yarn, to each beam, seven warps."

Mr. McCombs reported that he had run 312 sets for one slasher, during the month of March, and that the average of waste was 3.7 pounds per set, ranging from eight to four beams to the set, 3,500 to 2,800 ends to the beam, 6½s to 18½s yarn.

"How much did you run before the boss got after you, Mr. McCombs?" asked Mr. Wofford.

W. W. Splawn of Clinton stated that his waste, running six warps, with 2778 and 2410 ends runs anywhere from three to five pounds at the most, averaging around 3.75, with not very many over four pounds. At the Greenville meeting in October 1921, an average of ½ a pound per beam was suggested, and Mr. Splawn raised the point how many had been able to stay within this limit.

The point was also raised by Mr. Splawn as to the effect of the elasticity of the yarn at the run-out on the slasher,

and the effect of having a different number of yards. Mr. McCombs recalled that at the Greenville meeting he had recommended that the variation be figured in per cent, pointing out that a man on coarse yarns making the same number of pounds of waste as a man on finer yarns would have a different number of yards.

J. L. Dorn, superintendent, The Oconee Mills Co., Westminister, S. C., said at this point, "Speaking of run-outs on the slasher, I had some trouble about 22 years ago. I was second hand in spinning, and we were making a large amount of waste. I went after it and found that the finger on the clock would bind just at the particular time when the clock knocked off, and would make a short beam. I took and filed this notch—on a Draper warper—back a little bit so that the finger would bind against the side of it and bind it in such a manner that it would vibrate just before it knocked off. I never had any trouble with it after that. I make from two to three pounds of waste per set, about seven beams."

"I make a practice of having a little hook up right on the trigger and hanging a 1½-pound weight on that so that the very minute it runs off it stops the warper," added Mr. McCombs. "Some mills in the East use a very flexible spring fastened to the floor."

Another thing Mr. McCombs pointed out was that where a mill has more than one warper hand, it is the best practice to have all hands set the clocks just alike. He pointed out that in some cases the warper hand will pull the ends through and then set the clocks, while another will do the opposite, and that it is very easy to run the clock two or three minutes longer when doing this.

"Do you think it would be a good idea to have the section man set the warpers?" asked the chairman.

"That's all right," responded Mr. McCombs, "for some mills," adding that when he ran a 5,000 or 6,000 spindle mill he used to set them himself.

Taking up another phase of the subject, Mr. McCombs recommended placing the gear on the end of the measuring roll in a bearing. "Only a few mill men will agree that that gear will jump out of gear," he said. "It will. Let a girl slap her foot on a warper right quick and the measuring roll will sometimes jump out and miss a tooth. A number of years ago I cut my waste in half by having a bearing put in where the measuring roll is." This, he said, also prevents boys from turning the clocks back.

Getting back at this point to Mr. Burnham's question regarding the traveling electric fan, Mr. Harris asked for experiences on this topic. Mr. Gibson stated that his arrangement is "just a fiber fan that reaches from one end of the warper to the other just over the drop wires with a stand with bearings that hold it up. It is driven by a small belt—similar to a sewing machine belt—fastened on the tight pulley so that when the machine is in operation it runs. It does keep it clean, and costs very little."

Mr. Burnham said that he merely asked for experiences with regard to the traveling fan, that he was not using it. However, Mr. Chapman said, "Mr. Burnham was at my mill the other day and was telling me about an arrangement he has there for this purpose, and I wish he would tell us about it this morning."

Responding to this Mr. Burnham stated that he uses a half-inch air hose hung from the roof just above the drop wires. This has on it a nozzle, and when an end breaks down the operative grabs the handle of this and just runs it across one time and it blows it down straight to the floor and doesn't blow it over into the beam.

The "Dutch" Luncheon.

This concluded the discussion of the morning session, and the men repaired to the new Franklin Hotel up the street from the meeting hall, where a splendid luncheon was served.

Following the luncheon and smokes, the men returned to the Chamber of Commerce Hall at about 2:30 o'clock for

The Afternoon Session.

which was begun by Chairman Harris by the resumption of reading of the yarn variation reports. Those read in the afternoon and worked out during the lunch hour by the committee appointed, showed up as indicated in the accompanying table:

TABLE OF SPINNING VARIATION.

Standard Number	Percentage of Variation Under Standard	Percentage of Variation Over Standard	Total Variation
19.69s	9.34	5.7	15.04
13s	6.3	7.1	13.4
12s	6.8	9.4	16.2
50s	9.1	2.5	11.6
60s	7.5	5.8	13.3
59s	3.1	2.7	5.8
30s	3.3	7.5	10.8
40s	7.4	4.1	11.5
18.50s	9.6	10.5	20.1
29.50s	13	14.5	27.5
14s	7.2	6.6	13.8
13s	9.5	6.8	16.3
9.25s	8.1	8.4	16.5
18s	0	6	6
18s	1	5	6
29.50s	7.1	7.1	14.2
29.50s	8.8	8.5	17.3
16s	2	5.5	7.5
26s	1.4	2	3.4
22s	3.4	3.4	6.8
22s	2.9	4.2	7.1
14s	9.5	3.6	13.1
16s	5.2	7.5	12.7
14s	4.2	6.5	10.7
26s	6.5	2.6	9.1
10s	7.8	1.5	9.3
20s	4.4	3.4	7.8
40s	6.4	15.6	22
29.50s	.8	13.4	14.2
30s	6.9	11	17.9
30s	6.6	9.9	16.5
40s	17.3	13.5	30.8
40s	11.8	10.7	22.5

At this point the chairman made an appeal to the men that they make honest reports in carrying out this work. It was suggested that on additional blanks, further information such as the speed of the spindle, hank roving, twist per inch, length of stroke, size of ring, staple of cotton, etc., be included so that in going over the reports of variation, the Spinning Committee might be afforded a better visualization of the local conditions. It was decided that a new blank would be printed and this additional matter, at the direction of Chairman Harris, be included and another re-

port blank mailed to each member to be returned promptly so that the chairman could make a more complete and comprehensive report at the Asheville meeting in June.

In connection with the discussion on this data, Mr. Gibson stated that a committee of which he was a member, reporting at the Greenville meeting, had recommended that the Association employ, in addition to the present secretary, a recording secretary for collecting and keeping such records as these. Mr. Gibson stated that nothing had been done about this so far, and that he felt that such a secretary would be a valuable asset in the Association's work. This, however, would be a matter to be acted upon at an annual meeting of the whole body.

The next feature on the program was the reading of a paper prepared by J. T. Phillips, overseer spinning, Loray Mills, Gastonia, N. C., on the subject,

The Mechanical Upkeep of Machinery.

This paper, which in Mr. Phillips' absence was read by Robert W. Philip, associate editor of COTTON, said in part:

"In working up this paper I have taken in consideration my own personal experience and the ideas from three or four overseers of spinning. There are very few that agree wholly on the same system of overhauling and keeping up machinery. Of course what will apply to one room often could not be applied to another with good results.

"The condition of flooring, age of machinery, and any vibration that might be in the mill building should be taken in consideration when deciding as to how often overhauling should be done. I have seen mills that it would be well to get over every six months if possible. These were old mills and had a good many pieces of unbalanced shafting and motors full of vibration hanging directly under the frames. I am sure that every man here has had the experience of having an unbalanced motor or shaft directly under a frame. Every one knows the results—spindles shaken out of center, ring rails out of line and the frame in a generally bad condition; and it will stay in that condition until the shaft or motor is running reasonably smooth.

"For the balance of this paper I will presume that we have a mill that has been running five years. We will take for granted that all conditions are favorable as to good flooring, etc., and the machinery has been well kept in every respect. We will further presume that our question of vibration is just as nearly eliminated as it is possible to get it. Now, there must be some system established to keep this machinery in good order. I am going to outline a plan that we have followed for three years and have found entirely satisfactory on machinery that has run for a little over twenty years. (I contend that machinery that has run for five years should have this same attention.)

"We have enough permanent overhaulers to get over all frames once a year. These men line and level the frames thoroughly, including the ring rails; these should be lined both lengthwise and crosswise. It will be well to look over ring rails every year but if they are properly lined the first year they won't need much lining crosswise but they will lengthwise, every year if not oftener. The overseer or his second hands should see that no cardboard or paper is put under the feet of these frames. This will soon become saturated with oil and allow the frame to sag down and become out of line again. Well seasoned shingles should be used for this work.

"While the frame is down, all steel rolls are taken out and cleaned with gasoline or kerosene. All dents are to be taken out of flutes by some one who knows how this work should be done. We first have the damaged piece worked over with a fine flute file and followed up with a good smooth oil stone, (not pumice stone under any condition). Try this oil stone after the file and see the good results. Every worn neck is taken out and renecked. All stands have a line drawn over them and are put in place. While steel rolls are out on the racks we give them a good coat of Spanish whiting and brush them with a good stiff brush. This gives them a good dry finish as well as polishes them up a bit. The rolls are then put back in the stands and rigged up for running.

"The spindles are given attention next. All worn bolsters are taken out and replaced. All spindles centered both bottom and top. All that need repainting or straightening will be sent to the shop. Every base nut should have a washer. This will give a better swing on spindles. I want to state right here that no section man should be allowed to set a spindle where the ends won't stay up unless he knows his business. Almost every section man has a bobbin with a lot of glue on it and uses it for a spindle set. About ten per cent of them know just how to do this and therefore ninety per cent do more harm than good. We have taken the responsibility of managing help off of our section men altogether so as to give them all of their time on the upkeep of the machinery. We have found it a good investment to put on enough third hands to look after the help and see to the cleaning, etc. This gives the section man all of his time to keep up the machinery. Our section men have from 42 to 60 frames to look after.

"While on the question of spinning frames I will also give you an outline of our oiling system. Oil all slow gearing twice a week. All rolls both back and front Monday. Front rolls Thursday morning. All cylinder bearings daily, (most all mills oil middlings twice a week). All stands daily. Loose pulleys twice daily. Good heavy oil should be used on the rolls and stands, something that has a good body and won't run out on the yarn. Every overseer should have an oiling system regardless of what comes or goes. There is very little said about lubrication of machinery—even if it is the very life of it."

The first question taken up following the reading of this paper was, "What is a conservative cost per month for leather rolls per 1,000 spindles?"

Mr. Splawn of Clinton reported that "My cost per month per 1,000 spindles is $7.50. I use 1.2 rolls per day per frame, running day and night on 30s."

Discussing this subject, Mr. Brigman of Lancaster, said, "We have a roller shop to take care of 160,000 spindles. We cover the rollers for one or two other mills besides our own. I would like to say to determine the cost of covering rolls you have to take several things into consideration. First, whether or not you want all the cushions removed. If you do, the roller cost is going to be higher. Some spinners and superintendents desire that the old cushions shall be removed when the rolls are re-covered, so that they can have new cushions. I think this is unnecessary unless the cushions are worn out or damaged.

"Another large consideration in the cost of rolls is the grade of the skins. If you use a high grade skin you may expect to get good work, but if you use a poor grade I think

that the cost per roll or spindle will be higher. I think the best grade of skin is none too good. Our cost per spindle per year on 116,000 spindles is 9.3 cents."

"Now right here I would like to ask a question," requested Mr. Chapman. "Is it best to use the best roll cloth made, and use it more than once, or to use the cheaper grade and use it only once?"

"I think I can answer Mr. Chapman's question," said Mr. McCombs. "There are several things influencing it. It is just about like the shuttles on the looms. In a mill I visited not so long ago I saw some that had been running for fifteen years, and in my own mill I have seen some that had been running for five years. I think it is possible for a roll to run two weeks or five years. There are some cloths that will powder under the leather, there isn't a spinner here who doesn't know that, it will just sift out like talcum powder. If you knew just how long a roll was going to stay it would be economical to use the cheaper cloth, perhaps, but since you don't know, since they might stay in two weeks or five years, I would say use the best grade of cloth."

Mr. Wofford stated that three or four years ago he dated the cloth, and found that some of them came back in two weeks and some of them ran three years. It is a question, he said, if you use a good grade of cloth it will be easier to use it twice, but if you try it with one of the cheaper grades it will put you in a hole.

"I would like to get some information along the line of changing rolls," said the chairman. "Is it a good practice to allow the section man to put in ten or twenty new rolls at a time, aside from the rolls that have to come out, those that are damaged? Is anybody doing it?"

The practice of putting in a new roll in the front and transferring the roll formerly there to the middle and back was mentioned, and Mr. McCombs said, "But I don't think that you ought to take a roll out unless there is something the matter with it. I want as good a roll on the back as on the front."

Mr. Gibson, of Union, stated that at his mill they cover all the rolls used at Mr. McCombs' mill, the two plants being operated by the same company. He said Mr. McCombs had long since complained that he did not get enough rolls, and that finally he was furnished with all the rolls he wanted, and that a record was kept on the yarn and that it didn't show any difference. "Well, that's one of the freaks of cotton manufacturing," replied Mr. McCombs.

Mr. Splawn, in regard to putting in new rolls, stated that his system was, running day and night, to have the man take out so many rolls and all he has left he substitutes for rolls in use, indicating where he leaves off so that the man on the next shift can continue the work. Mr. Harris and Mr. Briggs explained similar systems, the latter stating he thought a roll ought to come out when it looks like there is something going to happen to it.

The next question was "What is your experience with reversing double flange rings?"

"I turned some over," responded Mr. Wofford, "but you never will get as good results by doing it. The temper is all gone and it is poor economy to try to run them turned over."

Mr. McCombs was of a similar opinion. With a new ring, he said, and the proper traveler, a man ought to be able to polish a ring in two or three weeks, but that that cannot be done with a ring that has been turned over.

"My experience is to put them on a certain frame and then lighten up in the number of traveler until they get in the proper condition, and then they last just as long unless you have an inferior ring to start off with. Sometimes they will wear out all over the room. I have a section man take a ring out of a certain frame and take it to a certain frame, and when we get through we have all the frames going in pretty good shape, but my suggestion would be not to scatter them all through the room, but put them on a certain frame and lighten up on the traveler." This statement was from J. A. Carter.

"Do you use any extra help on turning them over?" he was asked, and replied in the negative.

Mr. Dorn of Westminister said "I had a good deal of experience on turning rings over, on about 18,000 spindles. We took two frames at a time and took these rings out and put them in a vat of boiling water and concentrated lye and fished these rings out and polished them and put them back into the frames and they are running all right. That was about ten years ago and they are running all right yet. However, I find that if you turn them over all through the room, you will find some rings running fifteen or twenty years and others running two years, and you will get some bad running work. I might add that you never can polish the rings just right unless you use lye."

Taking the rings out of a whole frame and cleaning them with gasoline was the experience related by Mr. MacAuley. However, he said, sometimes when the room is damp and the bottom flanges get corroded and rusty, they have used a polishing brush. He stated however that he had never been able to get the best results with a turned over ring. He pointed out that it was costly to clean these, and that further with the turned over ring it was necessary to reduce the speed. On the other hand, he continued, he had changed eighteen frames from the No. 2 to the No. 1 flange ring, and had been able to increase his speed, on a 1⅛-inch roller, making 50s, from 102 to 119 r. p. m.

William P. Dutemple, of Charlotte, stated that some mills make a practice of sending back the rings to the ring manufacturers to have them re-burnished, getting a new ring on one side. He stated that the cost for doing this is about two cents.

"Before you get off of rings," requested Mr. Chapman, "I would like to ask for experiences on the No. 1 flange ring. We have had some on and it looks like they are wearing out too fast."

Mr. Brown indicated that he is using the No. 1 flange ring but had not had them in long enough to determine their wearing qualities. Mr. McCombs stated that one of the first mills in the South to put in the No. 1 flange ring was the Baldwin Cotton Mills at Chester, and inasmuch as the spinning foreman of that mill was in the audience, he might be able to report on them. This gentleman stated that the rings were giving satisfaction.

Another gentleman stated he had put in the No. 1 flange ring and that it has given them perfect satisfaction. As to changing travelers, he said in response to a query, he has the doffers start and change ten frames a day

Mr. McCombs said he has some No. 1 flange rings that have been in use for five years and that they show no signs of wear. "I see no reason," he said, "why a ring on coarse numbers should not last seven or eight years."

One man suggested that perhaps Mr. Chapman had gotten some defective war material.

"We put in some rings 22 years ago," said Mr. Dorn. "We put in a 1⅝-inch ring on filling, 17s, and a 2-inch ring on 15s warp. We changed to 30s and 40s and put a 1⅜-inch ring on filling and the 1⅝-inch rings on warp and we have between 50 and 75 per cent of those rings yet."

"Well," said Mr. Brown. "No man has a tale but what somebody can beat it. We are putting in some No. 1 flange rings that are replacing some they had in the mill in 1888. These rings were turned over when the big wash-out came to Clifton in 1903. The mill was turned over, too, but in a different way."

Mr. Wofford stated that his experience with the No. 1 flange ring is that the traveler doesn't wear out as quickly but that the wear is altogether on the ring. "Our rings are in worse shape than some of the No. 2 rings that have been running for twelve or fifteen years."

Marshall Dilling, chairman of the board of governors of the Association and superintendent of the A. M. Smyre Mfg. Co., Gastonia, N. C, asked Mr. Dutemple if he could tell how long the rings would run after having been returned to the factory for re-burnishing. The reply was that "the length of time that a ring can be run cannot be determined." Mr. Dutemple continued, in connection with the discussion regarding the No. 1 flange ring wearing out quicker than the No. 2, stating that the number of the flange doesn't affect the wear, but that the individual ring governs this altogether.

"If a ring that has run six years on 30s is turned over, how long would it last? " was asked. Mr. Dutemple replied that it could not be determined, the conditions would be different, "you would have a 12-year old frame, the condition of the frame has something to do with it, the vibration, different men running the frame, different humidity conditions any many other things. It is not possible to tell how long a ring will run, whether No. 1, or re-burnished."

Peter Quinn, of Atlanta, when called upon for a statement, declared that in his opinion it does not pay to turn rings over. He said when you take a ring that has run continuously for a long time and the traveler has drawn all the temper out of it, it gets rusty and it will not last very long. What wears out a ring, he said, is the friction of the traveler. Mr. Quinn also said that he believes it pays to put in the No. 1 flange ring.

Mr. Quinn pointed out that the great factor in running the No. 1 flange ring is in getting the proper circle traveler. "It is easy enough to get the weight," he said, "if you get the circle. If you run too large a circle traveler on the No. 1 it will wear it out quicker."

Referring to the ring itself, he said that it stands to reason that the No. 1 flange ring will last longer, for a heavier traveler can be used. He was asked if using the heavier traveler and running it at the same speed would not wear the ring out quicker, and the reply was in the negative. Mr. Quinn also stated, contrary to what might be expected, the round point traveler wears the ring out quicker than the square point traveler.

In connection with the ring discussion, Mr. Dilling asked Mr. Quinn regarding the use of the No. 1 on coarse numbers. "I can remember," he said, "when it was not considered advisable to use it on coarser numbers than 40s." "Yes," replied Mr. Quinn, "when they first started on the No 1, they never made it larger than 1⅝-inches. Eventually, though, they got so they made them up to 2½-inches," adding that some mills are using the No. 1 on even larger rings.

"In connection with the ring discussion at the Wrightsville Beach meeting," said Mr. Harris at the conclusion of Mr. Quinn's remarks, "we brought up the cost of travelers per 1,000 spindles per year, and at that time it ranged from $1.68 to $6.00. I should be glad to hear discussion on this at this time." Mr. Burnham reported a cost of $4.95 per year per 1,000 spindles.

"How low on twist can we go on 30s and get good weaving?" was the next question asked by Mr. Chapman. He is using 4.75 now, he said. "We are short on spinning and want to speed it up by taking out twist. Can we go down as low as 4.50?"

"I can answer that in part," said Mr. Burnham. "In the last six months we have done a great deal of experimenting on 1-inch cotton, about ⅞ to 1-inch, and we found the best results around 4.60 to 4.65." With regard to breaking strength, Mr. Burnham said he is not getting what he wants, he is getting around 51 or 52 on 30s. He makes his tests on a power machine, he said in response to a question from Mr. Chapman, turning 12 inches per minute. Then Mr. Chapman related an experience of about two years ago when he was having trouble with his breaking strength, getting about 50 pounds, while another man on the same numbers said he was having no trouble, getting around 60 pounds. Mr. Chapman said he sent his spinner down to this mill with some of his yarn to test it, and the spinner at the other mill, when he got there, asked him, "Well, what do you want it to break?" Then it was apparent that on the hand machine the other spinner had been getting whatever break he wanted. Mr. Chapman said his spinner brought some of the other fellow's yarn back and put it on their power machine and tested it and it didn't show up any better than his own.

It was nearly adjourning time by now, but Mr. Brown had a question he wished discussed: "In one of our plants we are having a good deal of trouble with short pieces of yarn coming up back of the drop wires, two to five inches long. This mill ran for forty years on plain looms and then when we put in the automatic looms these 'short tails,' we call them, began to show up. Where do they come from? The spooler hands; the warper hands; or where?"

Mr. Bagwell said the short tails will come from bad piecing up, pointing out that the doffers will make a short lap, and if they miss it will go down for it again and cause the short piece to go in rollers. Mr. Gibson said the doffers may cause some of it, but he thinks the biggest place is at the spoolers. He said they installed the McColl spooler guide and didn't have so much trouble as before.

"I have the same trouble," said Mr. McCombs. "I believe that some of them come from where Mr. Gibson says." Mr. McCall said he is having the same difficulty, and wanted to know what to do. "Well, we are punching the spooler hands and warper hands all the time," said Mr. McCombs. A. L. Ellis, of Pelzer, S. C., said he believed a good deal of it comes from careless creeling on the warpers.

Mr. Wofford asked if, with the filling wind, whether the yarn will spool better by having a bunch. Mr. Gibson answered this, saying that the advantage is in favor of the bunch. He is using it right along, he said.

The Youlten Opener

BY JAMES ROBERTSON.

There is no part of the cotton mill today that has received more attention in the past year than the subject of the proper opening of the cotton. Papers have been read, discussions held and numberless tests made on the use of the Crighton opener in single and in tandem. Some mills have gone to the extent of quadruple tandem connected Crightons, with the view of opening and cleaning the cotton thoroughly before the cotton has been touched by the beater of the picker, using the picker merely as a lap forming device thereby saving the cotton the severe beating treatment as far as possible.

Certainly the country today is in the proper state of mind for any advancement in the line of picking and opening. So there comes to us from England an entirely new idea in the line of opening in the form of the Youlten opener. This is not a new thing in England, but it has just invaded America and the first installation is now being tested by one of the largest cotton manufacturing companies in the East. There are a number of these installations now running in England, India, China and other countries with success, indicating its adaptation for use from the lowest grades of ordinary cotton to the highest grades of staple cottons.

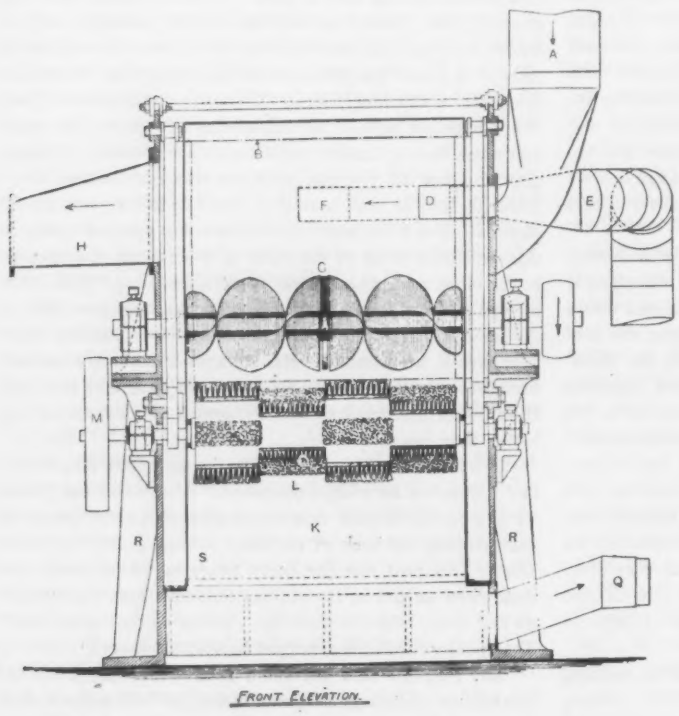


FIG. 1.

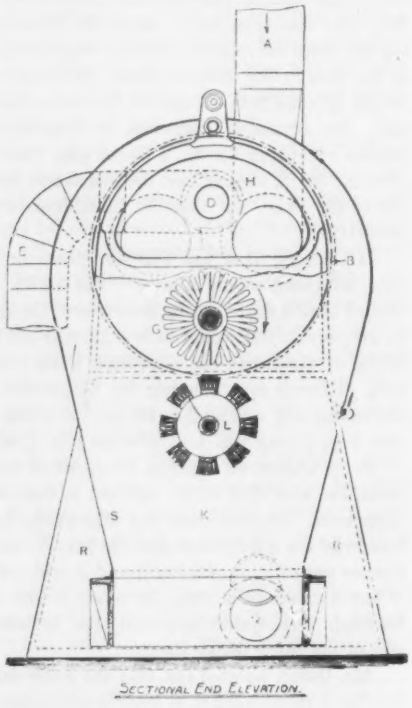


FIG. 2.

To give an explanation of the workings of the machine we will turn to the accompanying illustrations. To view the illustration we might judge that the machine is a bit complicated but really it is very simple and this is a factor much in its favor.

Looking at the front elevation the feed is marked as *A*, Fig. 1. This is connected to either an opener or hopper feed arrangement or else (which is found as good or better) the cotton is fed directly from the bale from the floor above down into the feed line *A*. The cotton drops directly into the interior of the machine. Gravity causes it to strike upon the rotor or vibrating beater *G*. This beater or rotor is unique in design. It consists of a number of fingers arranged in a double spiral form so that when the rotor is rotated the spiral will always screw toward the center. The reason for this will be explained later. Now this rotor is turning at the rate of 2,000 or more r. p. m. and has a diameter of 13 inches, giving a surface speed of over 80 miles per hour. The instant the cotton is struck by this high speed rotor it is immediately thoroughly disintegrated and thrown against the slowly revolving grid cage *B*. The cotton already being in a loose form and being thrown at a high velocity against the grid surface of the cage *B*, the dirt and impurities which are loosely held are thrown through the openings of the grids and fall to the bottom of the machine, being carried away to the settling chamber.

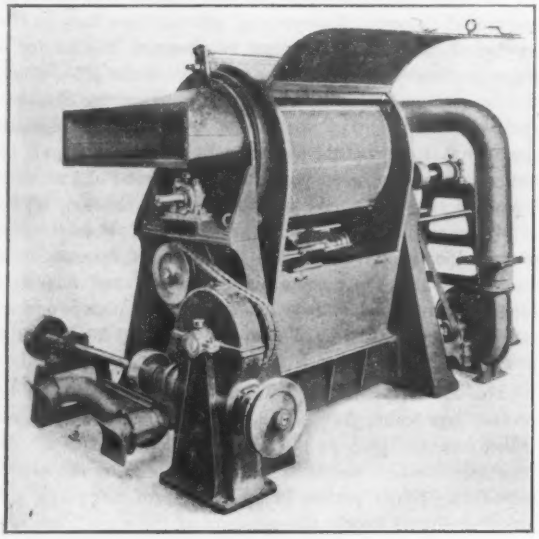
All this time the cotton is subjected to the influence of a strong draft entering from a fan through the pipe *E*, Figs. 1 and 2, and into the cage at *D*. If, after the cotton has been opened by striking the rotor once, it is light enough, it will be blown from the cage through *H* to a condenser or other arrangement for receiving the opened cotton. On the other hand if the cotton has not been opened sufficiently to allow the cotton to be blown over to the condenser then it will fall back and be struck by the rotor again and again until it is thoroughly opened. This draft from *D* may be varied so that any degree of opening may

be obtained. Some of the cotton is passed underneath the rotor which is near the bottom of the cage and has a clearance which is variable from one half inch up to any desired setting. This scrubbing action is intended to loosen any hard packed cotton even to a water pressed bale and open it up thoroughly. Also much dirt and foreign matter is expelled in this manner.

All the time the cage is rotating by means of a periphery drive which is kept clean by means of the revolving brushes *L*. The brushes revolve at the rate of 20 r. p. m. while the cage has a motion of 2 r. p. m. which is just enough to keep it thoroughly clean.

This cage, *B*, Figs. 1 and 2, is made up in sections so that any section of the cage may be substituted with another set or part of a set of screens with a different width of perforated openings. This is a valuable feature for if dirty low grade cotton is run, large openings in the perforated screen of the cage will be necessary for allowing more dirt and foreign matter to escape, while with longer staple cottons of higher grades a finer screen may be substituted. Another feature is that not all of one kind of screen may be used; for combinations may be formed with four different sized meshes giving different results in the droppings.

The construction of the machine is very rugged and



THE YOULTEN OPENER.

the high moving parts are all equipped with ball bearings insuring low power requirements and a long life. The rotor fingers (284 in number) are made of malleable iron. Fig. 3 shows an enlarged diagramatic view of a portion of the rotor.

The action of the opener may be said to be vibro-pneumatic and is somewhat similar to the Crighton opener in that the cotton is literally opened in space for the cotton is not held, nipped, compressed or injured while being opened. The principal actions of the machine and their purpose are as follows:

1. The swiftly revolving action of the rotor opens the cotton.

2. Making the cotton strike the cage forcibly and at an oblique angle to the perforated openings is to aid in removing the dirt.

3. The arrangement of the beater or rotor fingers is to give a vibrating effect to the cotton for removing microscopic dust.

4. The adjustable action of the current of air is to separate the opened cotton from the partially opened cotton.

5. The rotation of the screen is to give a clean surface always for cleaning the cotton.

6. The brushes are to keep the screen or cage clean which is the same in principle as a comb keeping the flats clean on a card.

This machine was tested at the mill in question against a tandem Crighton arrangement and it was found that the Youlten opener gave a very much better luster to the cotton which is a feature that would be very valuable to

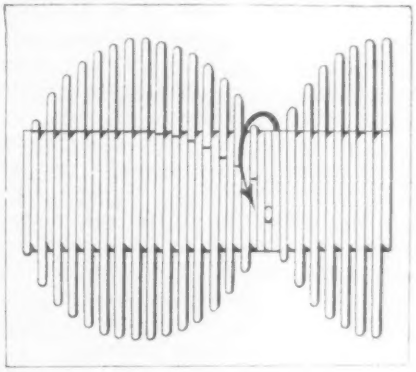


FIG. 3.

yarn mills. The theory for this luster is that the rotor fingers by their arrangement give a vibrating blow to the cotton and loosen the microscopic dust which is readily removed by the air current above or at the condenser screen.

The makers recommend that only one bale per hour be run through the machine but it has been found by experiment that the machine may be run at a rate of twelve bales per hour for a short period. The best results were obtained by the author at about 1,500 pounds per hour with Middling cotton inch and one-eighth stock.

The machine is very flexible so that almost any degree of opening may be obtained or any degree of cleaning may be done. The cotton can be opened with very little cleaning or it may be opened with a thorough cleaning. Either or both may be obtained.

A slightly different construction of machine is used for opening and cleaning wool. There are said to be a number of installations now working in England; some of the installations running solely on a commission basis.

The tests made in this country indicate that the machine is a step forward in the art of cleaning and opening cotton and it is creating a good deal of interest among even the conservative eastern mill men who have seen it in operation.

Cone belts, evener belts and check straps are being made a specialty by the Gastonia Belting Co., Inc., Gastonia, N. C. J. T. Lineberger is president, and has had 19 years practical experience in the belting business. A. F. Whiteside is treasurer. E. E. Farlow, who is also connected with the organization, has had 16 years experience in some of the larger shops of the country. Larger types of oak tanned leather belting are also among the products of this company.

Self-Government in an Industrial Village*

BY J. E. HARRIS.†

From the program, I believe that I am the only one to talk to you today holding the position that I do. By that, I mean, one whose duty it is to look at the social work both from the standpoint of what we would like to do and what can be appropriated financially for such work.

It is not at all difficult when considering this work and listening to your speakers to think of more that one would like to do than the profits of several years could pay for, but as Mr. Wm. H. Wood said sometime ago, it is the duty of management to consider the claims of employees and stockholders and public as well. It is the stockholders' money invested that makes possible our plants and we are bound to consider them along with our social work program.

To begin with, the self-governing councils or committees are not to be confused with those of the work councils or management committees that exist in quite a number of plants in this country. At the time of the last meeting of the National Conference of Social Workers in February 1922 there were some seven hundred and twenty-five of these councils. Work councils or management committees deal almost if not exclusively with conditions inside the plant, that is, with the working conditions; while the councils with which we are dealing have to do only with conditions outside the plant, or living conditions.

Probably no one who has been in charge of a plant employing a considerable number of persons but has at times felt very keenly the unpleasantness of various situations that thrust themselves upon him and upon which, in making a decision, he would be open to the charge of being arbitrary or autocratic. Especially is this true when almost the entire community is owned by the plant, making him practically responsible for its civic life. Those of you who are from such communities will understand what I mean. To the management come problems of every description, embracing the duties of landlord, mayor, councilman and employer, and to these are added in our case, those of the public utilities such as electric lights and the water system. There will be cases of chickens destroying neighbors' gardens; of "Johnny" breaking out window panes of the houses in his neighborhood, ranging to the more serious ones of drunkeness and disorderly conduct.

Under these circumstances, it frequently becomes his duty to make rules governing the community, and where no machinery such as we are considering today has been created, he is forced to rely upon his own unaided judgment or the advice of those who are close around him and in whom he has confidence. It is useless to argue that the behavior of the plant employees outside the plant are of no concern to the management, for if the proper moral conditions are not maintained in a community, we cannot expect a desirable type of employee to stay any longer than is necessary for them to find a community where they are.

It was in an attempt to maintain these conditions and at the same time avoid even the appearance of being arbitrary or autocratic that the experiment of self-governing councils has been inaugurated at our plant, and at least one other in Alabama. Some mills in other southern states have had similar systems in operation for several years and with apparent success.—EDITOR.)

Now in attempting an outline of the manner in which these councils are chosen and the way in which they work, it must be understood that the methods and plans described are not considered final. I think that one great mistake that is frequently made in attempting to work out a program of this kind is to go too fast. We know where we want to go and we are too impatient to get there to do the slow pioneer work of laying the foundation, and consequently our plans fail to produce the results that they might have had we been content to have taken more time. At the present time, our council does not deal with any conditions in the plant, but as time goes on, we expect that they will gradually be extended to cover these also.

The first step in choosing one of these councils is to divide the town into wards or districts as nearly of the same size in number of population as possible. These wards or districts contain usually from three to four hundred residents and consequently a councilman represents that number of persons. Everyone of age who has been in the employ of the plant for at least two years is eligible for a place on the council, except the members of the office force, the foremen and their assistants. The reason for disqualifying these is that they are frequently so close to the management that they would be considered simply as a part of the management; these men form really a kind of executive board of the plant. At the time of the election, a list of all the eligibles from each ward is drawn up in the employment office and handed to the assistant foremen, who meet together as a nominating committee, and nominate three men from each ward. This part of our plan is one we consider only tentative. We hope to work out a plan for a primary to choose these.

This list is posted on the bulletin boards of the plants several days before the election. The elections are by secret ballot and are held in the different departments of the plant, the election managers being appointed by the superintendent. Every person in the employ of the plant is a qualified elector except the members of the office force, the foremen and their assistants.

After the election, the names of those elected are certified to the superintendent who appoints a man to act as chairman of the council. This man is the only one on the council who represents the management, and he may be anyone who has been in the employ of the plant for two years regardless of what position he may hold. A list of these names is then posted as those who are to serve for the ensuing term which is usually one year. In some plants in order to avoid having an entirely new set of councilmen for each term, it is the custom for one half of the council to retire when their successors are elected. There is no set time for the council meetings, but usually these are held on Monday of each week.

Any councilman who desires to call a special meeting of the council can do so by requesting the chairman to that effect. The duties of the council are many and it would be

*Extract from an address before the Eighth Annual Session of the Alabama Conference of Social Workers.

†Agent at Tallassee Mills, Tallassee, Ala.

hard to give them in detail but the main ones are to pass on all cases of drunkeness or disorderly conduct of any nature, to notify the management of any unsatisfactory conditions of whatever description in the village, such as bad places in streets, poor sanitation or anything that might escape the attention of those responsible. It is also the duty of the council to advise the management of proposed rules for the government of the community, such for instance as to whether dancing should be permitted in the community buildings and if so, on what nights and under what conditions.

It frequently happens that troubles arise in a councilman's ward that affects only those of his ward. In such cases, he is usually able to compose their differences alone or at most with the aid of his chairman. It is in this way that the majority of the cases that are brought to the attention of the council are handled.

Whenever there has arisen a case that is sufficiently serious to warrant the calling of the entire committee, the chairman issues a call for such and the offender is requested to be present. The case is reviewed and if in the judgment of the council the offense warrants it, a recommendation of dismissal is made to the superintendent, but more often the offender is let off with a warning to "Go and sin no more." The only penalty that can be inflicted by the committee is of course dismissal from the plant's employ, or more properly, a recommendation to that effect. The right of veto of the council's recommendation is reserved by the superintendent, though in practice this is rarely if ever used. Where a recommendation is made, the wisdom of which is doubtful in the judgment of the superintendent, he requests the chairman to call a meeting of the council and going before them, states any objection which he feels to the recommendation, and they then go over the case until some mutually acceptable ground is found. In justice, it should also be added that instances of this nature are not of frequent occurrence.

Just an instance or so by way of illustration: One, which of no great importance, is of particular interest in showing how a management truly desirous of making rules for the good of all may be mistaken. This was a rule that had long been in force and concerned gardens and the keeping of chickens by the employees. This rule required that those having gardens must fence them and that chickens be allowed to run at large. There had never been any complaint made against this rule, but to the surprise of the management one of the first acts of the council was to reverse this rule and to require that the chickens be kept up. When a general rule of this nature is made by the council, it is typewritten and signed by each member of the council and posted on the bulletin boards of the plant, thus giving additional prestige to the council.

It is not intended to paint too rosy a picture of the accomplishments of this plan, neither is it contended that it is a panacea for all the ills that go with the duties of management, where the oversight of living conditions is a necessity, but the following conclusions may, we feel, justly be claimed for it in the light of our experience.

It creates in the minds of the employees a feeling that the management is sincerely desirous of having their cooperation and of consulting their wishes in the making of rules governing the living conditions of the village. It reduces the number of offenses against the community. The council will be found to maintain fully as high a standard of behavior as the management, or at least such has been the case in instances which have come under my own observation. It is wholesome experience for offenders to be tried by their fellow-workmen, and under this plan, the charges of any favoritism or of harshness on the part of the management are reduced to a minimum. It is also a wholesome experience for the workmen to have some idea of the problems that constantly confront the management in the conduct of affairs. It is obliged to give them a new insight to these things, and give them an entirely new attitude toward them. We have had members of the councils tell us that they expected to be grey haired before their term was out, and that if it were necessary for them to handle these affairs for five years, they firmly believed they would go crazy.

It is a means in some instances of developing the men themselves who are on the council. I have in mind a man who was so high tempered that it caused some concern to the management when he was elected, but to the surprise of all, the duties of the council seemed to have exactly the right effect upon this man and he has since that time been promoted to assistant foreman of one of the departments, a promotion his disposition previously would have made impossible.

After a careful weighing of all the facts both for and against this plan, it is our considered judgment that any one desirous of promoting harmonious relations between the management and the employees of a plant will find it worthy of serious consideration and full of promise of better things to come.

A Useful Booklet.

One problem that mill managers are confronted with in considering the installation of chain hoists and overhead conveying systems in different departments of the mill, is to determine exactly the type needed for the particular purpose, and how it can be most efficiently and economically installed.

To overcome this problem, the Chisholm-Moore Manufacturing Co., Cleveland, Ohio, who recently became sole distributors of the Atlas Carryall Truck System, have issued a book of instructions detailing all the steps necessary in making these installations. The instruction material is prepared in a very convenient manner, including drawings and directions regarding a variety of types of installations, covering inside installations for all types of mill or other buildings, size of bolts to be used, tables showing safe loads on yellow pine beams and I-beams, and other information which should prove useful to the mill man considering the installation of equipment of this type, by enabling him to determine the particular type of system required. The booklet may be had upon request.

The 18th annual edition of Fraser's Textile Directory, devoted to the industry in Canada, has been issued. Lists are given of all Canadian manufacturers, wholesale merchants, commission agents and department stores of dry goods and apparel and allied lines. Fraser Publishing Company, Southam Building, 128 Bleury, Montreal, Canada, are the publishers. The price is $2.00 per copy.

Permanganate of Soda as a Bleaching Agent

BY WILLIAM B. NANSON.

Many years ago the author, who was at that time acting as an assistant to the eminent chemist, Fessie du Mothay, made a series of exhaustive experiments as to the bleaching qualities of permanganate of soda. The permanganate itself was made at the immense chemical works—the Usine de Comines at Comines on the river Lys, near Comines in Northern France, and the bleaching experiments were conducted at the laboratories connected with the works at Comines and sometimes also at the laboratory of Mr. Georges Verley, a large linen manufacturer at Lille, who was interested with Fessie du Mothay, in the chemical works at Comines.

The writer subsequently introduced the process and put it into practical operation in linen bleacheries in England, Ireland, Scotland, Denmark, Sweden, Russia, Finland, and Austria. At that time it was considered too expensive a process for cotton goods, even though the price of permanganate was only six cents per pound, while for wool and silk it was never considered. With linen, however, and with ramie, esparato, hemp and jute we got remarkable results, not only in the quality of the results produced, but also in the saving of both time and cost of materials. We reduced the time required to bleach some linen goods (Huckabacks) from six weeks to 56 hours.

The principal stumbling block to its general adoption by both linen and cotton bleachers in those days was the difficulty of obtaining and the inconvenience of handling and transporting large quantities of sulphurous acid which was always handled in carboys. In those primal days the metallic container and the tank car were still among the possibilities of the future, and the bisulphites and the hyposulphites merely chemical terms of the laboratories and unfamiliar to the mere layman, moreover, in those good old times the average bleacher was a conservative man who believed in faithfully doing things on the same lines laid down by his forefathers in the times which had gone by. They called it being conservative—we called it something else. The writer knew one bleacher in Barnsley, England, who, while admitting all we claimed for the permanganate bleach, declined to adopt it because he had 500 acres laid out in bleaching greens that would be rendered useless to him.

The permanganate of soda bleach was a good thing then, and it would be a good thing now if properly exploited, and it passes beyond the comprehension of the writer that no one has taken the matter up in this country and made a commercial success of it, for, in combination with other chemical compounds, which have become commercial products since Fessie du Mothay tried to introduce permanganate of soda as a bleaching agent, it is one of the most valuable bleaching agents known.

We hear a good deal about permanganate of potash. Oh yes, but not of soda, and the price of potash makes it impossible as a commercial bleach.

Permanganate of soda as made by Tessie du Mothay's process is formed by the double decomposition of manganate of soda and magnesium sulphate, the manganate being composed of manganate dioxide (MnO_2) known as the black oxide of manganese, which is found native as *pyrolusite*, and caustic soda.

For its preparation, 3,000 pounds of soda ash are converted into caustic soda by lime. It is then mixed with 700 pounds of maganese dioxide and ignited in a shallow vessel at a dull red heat for about 48 hours. The mass is treated with water, decanted, and the solution evaporated to the required concentration. This solution is the one used for disinfecting purposes and is known by the trade name of Condy's fluid. It is a very alkaline liquid and not used for bleaching.

For bleaching purposes the manganate is usually made by fusing equal weights of finely powdered manganese dioxide and caustic soda, a sesquioxide of manganese being produced at the same time. By the addition of potassium nitrate, or by performing the ignition on a flat vessel where the mass is exposed to the air, a portion of this oxide is re-oxidized, which increases the yield of the manganate, in the interests of economy, however, it is not neeessary to add nitrates.

The mass, after fusing and extracting with water, forms a fine green solution which, on evaporation *in vacuo*, produces green crystals isomorphous with sodium sulphate and chromate. The solution, especially if diluted, when exposed to the air becomes converted into the permanganate with precipitation of hydrated manganese dioxide, the liquid passes through various shades from green to pink and is sometimes called "mineral chameleon." In presence of an excess of alkali, this does not take place, and it is therefore better to have a slight excess of alkali in the solution to stabilize it. On the addition of free acid, especially sulphuric acid, the change is immediate, the alkali and manganese, instead of being liberated as hydrates, being at once converted into sulphates and thus losing their tendency to reproduce the manganate. Sodium manganate is a powerful oxidizing agent. Its general action in this respect resembles that of the permanganate.

The magnesium sulphate used in the process was the native sulphate, it is a mineral called *Kieserite* ($MgSO_4H_2O$) and is found in the salt mines of Stassfurt, Germany. Kieserite is sometimes found in rhombic prisms of some purity but it more generally occurs in granular masses. The crude Kieserite obtained from the upper layers of the Stassfurt salt beds is first freed from magnesium and sodium chlorides by being placed in large sieves, standing in tanks of water. The two salts mentioned dissolve out, while the Kieserite, which is very sparingly soluble in water, falls through the meshes of the sieves in a state of fine powder. Any gangue or other impurities such as anhydrite or larger lumps of rock salt remain behind in the sieves.

The kieserite is then packed into conical wooden moulds, where it sets to a compact solid, owing to its combining with six more molecules of water to form "epsomite" $MgSO_47H_2O$. This solid "stone" is then dried and afterward powdered. In this condition it contains 80 to 90 per cent of sulphate of magnesium $MgSO_4$ and about one to two per cent of sodium chloride, and it is in this form that

we used it at Comines to convert the manganate into the permanganate of soda, and it is also brought into the market, being exceedingly cheap, for many other commercial or manufacturing purposes. Again, for other purposes, it is dissolved in and recrystallized from water, and brought into the market as Epsom Salts.

It is quite possible to make permanganate of soda at one operation in the same manner that permanganate of potash is made; for instance: 500 parts caustic soda lye (45 degrees Baume) are evaporated with 100 parts potassium chlorate mixed with 180 parts finely powdered black oxide of manganese, and ignited in iron pots until quietly fused, cooled, with constant stirring, again heated to redness, cooled and extracted with water. Again—another way: 12 parts solid caustic soda are dissolved in 58 parts of water and heated with 12 parts of potassium chlorate and 18 parts of black oxide of manganese, until it begins to crumble; the heat is then increased to redness and the mass, after cooling, is extracted with 200 to 220 parts water. Again—a third: To a fused mixture of 10 parts caustic soda and one part niter are added six parts strongly heated manganese oxide; the cooled mass is ladled out and extracted by water as before.

There are, however, various objections to the making of the permanganates directly. In the first place, it costs more to make them. In the next place they are neither so reliable nor so stable. (I am referring more especially to soda now). Again, it is more convenient and the results more certain if they are prepared by the action of an acid on the manganate. Again, sodium permanganate is much more difficult to purify by crystallization than potassium.

It is also obvious that, aside from economical reasons, it is better to convert the comparatively inert and stable manganate into the active and unstable permanganate at the moment of using and this is being accomplished by Tessie du Mothay's system. The manganate on the one hand, a finished product, is mixed dry with the Kieserite, another dry finished product, in about equal parts, and barreled up and in this form the mixture is sent to the market. No chemical change takes place in either until the cask is opened and the two compounds come together in solution in cold water, when a solution of permanganate of soda is formed according to the following equation. $3Na_2MnO_4 + 2MgSO_4 + 2H_2O = Na_2Mn_2O_8 + 2Na_2SO_4 \times 2Mg(HO)_2 + MnO_2$.

It is an extremely powerful oxidizing agent; each molecule contains five atoms of "available" oxygen, i. e., more than any other salt. Sodium permanganate is expressed by the terms $Na_2Mn_2O_8$.

In practice the goods to be bleached are steeped, after thoroughly scouring, in a warm dilute aqueous solution of permanganate of about 2 to 5 per cent strength. If the pink color rapidly disappears, more permanganate is added. After a short time the material becomes coated with a brown deposit of manganese oxide in accordance with the equations:

$$2Na\ MnO_4 = Mn_2O_3 + Na_2O + 2O_2$$
$$2Na\ MnO_4 = 2MnO_2 + Na_2O + 3O$$

The liberated oxygen being nascent oxidizes the coloring matters. The next process is to remove the goods from the permanganate bath and wash them and then put them in a solution of sulphurous acid, or in acidified sulphite of bisulphite of soda. Sulphurous acid reduces the oxides of manganese to manganous oxide, MnO, sulphuric acid being at the same time produced, which dissolves brown manganous oxide from the goods forming a colorless and soluble compound which is easily washed out in the following process, thus:

$$Mn_2O_3 + SO_2 + H_2O = 2MnO + H_2SO_4$$
$$MnO_2 + SO_2 + H_2O = MnO + H_2SO_4$$
$$MnO + H_2SO_4 = MnSO_4$$

The manganous sulphate and all traces of acids are now removed by thorough washing with water. In the case of cotton goods it is very important to remove every trace of acid as, otherwise, tendering will result on drying. Later we will show an improvement on this sulphurous acid process, but this is the process as introduced by Tessie du Mothay.

The degree of the bleaching may be tested by taking out a sample of the goods from the permanganate bath and treating it with sulphurous acid. Permanganate may be used, if so desired, in an acid solution, sulphuric acid being generally employed. In this case the brown oxide of manganese is dissolved as it is produced, in accordance with the equation $Mn_2O_8 + 2\ H_2SO_4 = 2\ MnSO_4 + 2H_2O + O_2$ but we do not recommend it, though in some cases it may work out all right.

Sometimes, as in the bleaching of mixed cotton and wool, the production of alkali in the bath is a very decided objection. The addition of acid in this case might be an advantage, but even in the case of wool it is better to prevent any changes of undue alkalinity by the addition of magnesium sulphate, which replaces the accumulation of the sodium hydrate in the bath by its equivalent of perfectly harmless magnesia, thus: $2NaOH + MgSO_4 = Mg(OH)_2 + Na_2SO_4$. The use of magnesium sulphate necessitates, of course, its subsequent solution in an acid by souring the goods and removal by thoroughly washing.

Hydrosulphites, or meta-bisulphites, are frequently used as reducing agents in place of sulphurous acid and are also much more convenient to handle and also more efficient. Hydrogen peroxide, which in this case takes the part of a reducing agent, may also be used, especially as it intensifies the bleaching effect. Manganese di- and tri-oxides and hydrogen peroxide mutually decompose each other with the production of manganous oxide and oxygen. The latter, being nascent, exercises its bleaching effect, and the manganous oxide is subsequently removed as usual by a sour and wash. Sodium permanganate is little used for cotton goods, though it is eminently suitable for small lots of fine goods, laces, etc., as the very best of whites can be obtained with it.

More recently it has become the practice, where permanganate has been used, to replace sulphurous acid (or sulphur dioxide) as a reducing agent for permanganate, by hydrogen peroxide, sodium peroxide, oxygenol or hydrosulphurous acid. Hydrogen peroxide is immediately decomposed, on contact with manganese peroxide, into water and active oxygen ($H_2O_2 = H_2O + O$) so that an intensified bleaching effect is set up.

It may possibly happen that an insoluble layer of manganese peroxide is formed on the fabric to be bleached, and prevents the complete decomposition of the excess of sodium permanganate on the fiber, in which event this per-

manganate also is reduced by contact with hydrogen peroxide, so that a further quantity of bleaching oxygen is subsequently brought into action on the stained portion of the goods from two sources. In this after-treatment the addition of acid to the hydrogen peroxide bath serves the purpose of converting the manganous oxide formed by reduction into a readily soluble salt that can be eliminated by washing.

For the foregoing reasons sulphur dioxide is never used with hydrogen peroxide, because it would absorb a large proportion of the active oxygen from the peroxide for its own oxidation to sulphuric acid. The after-treatment mentioned of the brown manganese peroxide on the fabric may be carried out with either pure hydrogen peroxide or, in place of the latter, with the peroxide liberated by treating sodium peroxide or oxygenol with an acid.

At a sufficiently low temperature sodium peroxide dissolves in water containing acids; hydrogen peroxide and the corresponding sodium salts being formed. To every 100 parts by weight of cold water, which must be free from iron, add 0.675 parts of commercial sulphuric acid, stirring this in well and then sprinkle with a dredger 0.5 part sodium peroxide in small quantities at a time into the the liquid with constant stirring, taking care that the whole of the peroxide is dissolved completely. Add enough additional peroxide or ammonia to give an alkaline reaction, the mixture is then treated with a little acetic acid and ammonium chloride. These chemicals must be used in the order given.

To prepare the reducing agent from oxygenol equal parts of oxygenol and ammonium chloride are dissolved in a suitable quantity of water and a quantity of 10 per cent acetic acid is added. The solution clarifies quickly. The addition of ammonium chloride is to accelerate the solution of the manganese peroxide in the acetic acid.

The solution prepared from sodium peroxide is more sluggish in action than the oxygenol preparation, owing to the presence of saline constituents (sodium sulphate) which greatly retard the dissolving of the small quantities of the manganese or manganous oxide. This explains why the addition of ammonium chloride may be omitted when hydrogen peroxide is used. The solution above contains five per cent of acetic acid, which strength cannot be exceeded without risk in most cases.

Commercial hydrogen peroxide, mixed with an equal volume of 10 per cent acetic acid, will readily dissolve manganese oxide, or sodium permanganate reduced on the fiber, without the application of heat.

In practice, vegetable fiber is placed, after a thorough scouring, in a solution of permanganate of soda until the bath is decolorized, which means until the permanganate is decomposed, a dilute solution of sulphurous acid or some acidified bisulphite follows, followed by a sour and wash, and these operations are repeated if necessary.

For wool—say 100 pounds—well scoured, 4 pounds of sodium permanganate and 1½ pounds of sulphate of magnesia are used. Enough sulphurous acid is taken to destroy the manganese oxide fixed on the fiber. The wool is then washed in clean water, followed by a bath containing 1½ pounds of soap, ¾ pound of ammonia and 2 pounds of sulphate of soda per 100 pounds, or, it may be washed off and rinsed in a little acidified peroxide of hydrogen water and thoroughly washed, this latter process is the best to follow.

In neutral solutions the reduction of the sodium permanganate takes place regularly, but slowly. In alkaline solutions the reduction very probably takes place in two phases. In the first the violet coloration of the solution changes to green when the fabric is entered, a partial precipitation of manganese peroxide upon the fiber taking place. In the second phase the green manganate very slowly loses its color, and the manganese remaining in the solution is very slowly deposited upon the fiber. In acid solutions the reduction takes place much more regularly and in shorter time than in the other two conditions. The alkaline bath is prepared by adding caustic soda in the quantity theoretically required for the transformation of the permanganate into manganate; the acid bath contains an addition of sulphuric acid as is theoretically necessary to liberate all the permanganic acid. Now this yarn (wool) which is treated in a neutral or an acid bath will be as strong as before, but that which has been treated in an alkaline bath will be tender; hence the necessity of keeping the bath at all times, when bleaching wool, at least neutral, and it is far better to keep it acid. If as much sulphuric acid is at once added to the permanganate of soda bath as is necessary to dissolve the manganese oxide as it is formed by the reduction, the bleach can be obtained in one bath without injuring the strength of the fiber. This is, in fact, the case if a sulphuric acid bath of 5 degrees Baume is used, and the yarn does not become colored brown at all, but becomes white directly.

If cotton yarn, which has been boiled or scoured with caustic soda lye of four grammes per liter under 30 pounds pressure, is operated upon, and then well washed, the yarn is perfectly bleached by an immersion of about five hours. It is necessary, however, to gradually add the permanganate as a concentrated solution, with stirring, in two or three portions, and to raise the temperature to 15 to 20 degrees C.; ½ kilo sodium permanganate is enough to obtain a good ordinary white upon 100 kilos of gray cotton yarn or piece goods.

In bleaching wool and silk, a little magnesium sulphate is added to the permanganate bath, on account of the formation of caustic soda during the decomposition of the solution. After removal from the bath the materials are treated with a cold, dilute solution of sodium bisulphite, to remove the brown stain, after which they are washed in slightly acid water, followed by clean water and dried. I might say here that if a little hydrogen or sodium peroxide be added to this souring off water it is a great help to the bleach.

When the permanganate process of bleaching was first introduced by Tessie du Mothay, sulphurous acid alone was used as a reducing agent and on account of the inconvenience of handling it the process received a black eye. Now, however, the various salts containing sulphurous acid can be used both cheaply and conveniently and the permanganate of soda process of bleaching made, financially, profitable for all classes of fibers both vegetable and animal, except possibly cotton, which can be bleached more economically with chlorine.

We have sodium bisulphite and hydrosulphite and other compounds of sulphurous acid; for instance, the fibrous material to be bleached is entered into a solution containing sodium bisulphite and hydrochloric acid, in which the acid combines with the sodium to form common salt and

(*Continued on page* 583.)

What the Southern Mills Are Doing

Continued expansion and new development in physical properties, surpassing in activity even the accounts of previous periods, it seemed, and an increase in wages of ten per cent in some sections were the features of the southern textile field during the past month.

One announcement that renews interest in a development of another phase of textile manufacturing is the definite statement that 250 acres of land at Camp Sevier, near Greenville, S. C., have been purchased by the Southern Worsted Corporation, who will erect their $1,000,000 woolen mill thereon. As announced in these columns last month, this concern will be a southern subsidiary of the Waterloo Textile Corporation of New York. Its capitalization will be $1,200,000, half common and half preferred.

B. E. Geer, president of the Judson Mills, Greneville, and one of the South's more prominent cotton manufacturers, has been elected president of the Southern Worsted Corporation, with F. A. Fleisch, of New York, vice president; A. M. Patterson, of New York, treasurer; Adolph Bauer, of New York, assistant treasurer; and James F. Syme, secretary and general manager. Mr. Syme has been located at Pawtucket, R. I., but will move to Greenville and have active management of the plant.

Lockwood, Greene & Company are the engineers in charge of the construction of the plant, which will include 120 automatic looms, together with spinning and finishing machinery. This will be the first large woolen manufacturing establishment in this section.

Caldwell Cotton Mill Company, Lenoir, N. C., has been organized for the construction of a mill at Hudson, it is announced. The incorporators are A. M. Kistler, T. H. Broyhill, B. B. Hayes, H. W. Courtney, Mark Squires, J. H. Beall, M. T. Hickman and Rufus L. Gwyn. Mr. Gwyn is reported to be forming the organization.

Elmira Cotton Mills Co., Burlington, N. C., have begun the erection of a large addition to their plant, which will be 115 by 168 feet, two stories, with saw-tooth roof. There will be 200 additional looms installed, as well as carding and spinning machinery. A dyeing plant and additional machinery will also be installed, and 25 new dwellings for operatives are planned by the mill management.

A 40,000-spindle cotton mill, to manufacture denims, will be constructed by the Erwin Cotton Mills, at Duke, N. C. The building will be of reinforced concrete construction and will be modern throughout. Operatives' homes and the necessary warehouses will also be erected. J. E. Sirrine & Company, Greenville, S. C. are the engineers.

Enlargement of the bleachery, and increased production of the bleachery and sheet factory, are included in the plans of the Erwin Cotton Mills for the further development of their plant at Durham, N. C.

A modern finishing plant will be installed in a new addition to be constructed by the Gibson Manufacturing Company, at Concord, N. C., according to an announcement made by E. C. Barnhardt, Sr., president of the company.

Art Cloth Mill, Gastonia, N. C., will erect a weave shed, of daylight construction, for the manufacture of mixed silk and cotton cloth. Dyeing equipment will be installed and probably other finishing machinery. J. E. Sirrine & Company are the engineers.

Resumption of construction on its plant has been begun by the Oakboro Cotton Mills, Inc., Oakboro, N. C. The first installation will be 6,000 spindles, for manufacturing fine yarns on cones. The capitalization, as announced, is $250,000. J. A. Groves is manager.

Amazon Cotton Mills, Thomasville, N. C., are erecting 30 new cottages for operatives.

L. Banks Holt Mfg. Co., Graham, N. C., will install the Cocker continuous system for dyeing indigo warps. This equipment is manufactured by the Cocker Machine & Foundry Co., Gastonia, N. C.

The Tuckaseege Mfg. Co., at Mount Holly, N. C., is to install new machinery in a recently constructed addition which will double the plant's capacity.

Chadwick-Hoskins Co., Charlotte, N. C., are erecting 25 additional cottages.

The South Gastonia mill superintendents and overseers were the guests at a recent banquet of the presidents and treasurers of the fourteen mills located in the southern section of the city. It was planned to organize a mill men's club and meet once a month.

Work is progressing on the installation of machinery at the Bearskin Cotton Mills, Monroe, N. C., and it is hoped to have the new equipment in full operation within a short time.

Red Springs Cotton Mills, Red Springs, N. C., have purchased 160 Stafford automatic looms for the manufacture of sateens.

The following equipment is being added by the Roanoke Mills Co., Roanoke Rapids, N. C.; 42 looms, eight spinning frames, two intermediate frames, eight cards, and two breakers. A warehouse for the storage of finished goods will be erected.

Harden Manufacturing Co., Worth, N. C., is repairing and repainting their houses and is also assisting in the construction of a new church building in the village.

A $10,000 addition is to be made to one of the Highland Park Manufacturing Company plants in North Charlotte, N. C.

Additional yarn machinery is planned by the Delburg-Linden Company, at Davidson, N. C.

White-Parks Mill, Concord, N. C., will double the size and capacity of their plant, it is announced, the additions giving a spindleage of 4,032 for this yarn mill.

Elm Grove Cotton Mills, Lincolnton, N. C., have recently added three new speeders, doubled the drawing, and added double creels to the spinning frames. They manufacture 24s and 26s ply yarns from Delta staple cotton exclusively.

A new mill, to be partly financed by New England capital, will be erected at Huntersville, N. C., it is reported.

The new addition of the Patterson Mills Company, at Roanoke Rapids, N. C., will soon be in operation, it is expected. The addition is 100 x 144 feet, two stories high. It will be used for weaving and cloth rooms, with the lower floor utilized for finishing and the supply room.

Anchor Mills, with a capital stock of $1,500,000, have been organized and will erect a plant at Huntersville, N. C. C. W. Johnston, J. Leake Spencer and R. H. Johnson are among the incorporators.

Eno Cotton Mills, Hillsboro, N. C., are adding machinery.

Marion Cotton Mills, Greenville, S. C., have been incorporated, having taken over the Riverdale Mills there. Improvements are planned, according to report.

A cold storage and ice plant for use of operatives is being constructed at Steele's Mill, Cordova, N. C.

Hart Mills, Tarboro, N. C., are to construct an outside opening room and install vertical openers, it is reported. The Fountain Mills, at Tarboro, recently added five cards, a spinning frame and 36 additional looms, and will probably erect an office building.

Liberty Cotton Mills, Clayton, N. C., of which C. M. Horne is president, will do extensive building and installation of machinery in connection with a recent increase in capital.

The Franklinville Manufacturing Co., and the Randolph Manufacturing Co., Franklinville, N. C., have been taken over by a new corporation, The Randolph Mills, Inc. John W. Clark, president of the Southern Textile Association, and formerly superintendent of the Erwin Bleachery at West Durham, N. C., heads the company as president and general manager. J. Harper Erwin is chairman of the board of directors, and J. Harper Erwin, Jr., is secretary-treasurer. The two plants have a combined equipment of 12,464 spindles, and 360 looms making print cloths and sheetings.

Marshville Mfg. Co., Monroe, N. C., has incorporated to erect a tire fabric mill. Land has been secured for a site. S. M. Robinson, Lowell, N. C., Morehead Stack and Joe Hudson of Monroe, are among the promoters of the enterprise.

Rhodhiss Mills, Rhodhiss, N. C., have purchased 300 Hopedale looms to replace plain looms.

Mooresville Cotton Mills, Mooresville, N. C., are changing from shuttle changing to bobbin changing Stafford looms which will be equipped with individual drive.

Gem Yarn Mills, Cornelius, N. C., are installing 2,000 spinning spindles and 2,500 twister spindles.

Rhodes Cotton Mills, Waco, N. C., has been organized with a capital of $250,000 and will erect a 5,000-spindle mill. Posey Rhodes, of Lincolnton, N. C., is president.

Work of erecting a 100,000 gallon steel reservior at the Gaffney Manufacturing Company, Gaffney, S. C., has been completed. The new reservoir will provide fire protection facilities as well as supplying a source for the humidification system.

The capital stock of the Duncan Mills, Greenville, S. C., has been increased considerably, it is reported, and the erection of a weave room is contemplated.

The Mansfield Mill, Lumberton, N. C., will be 177 x 280 feet, one-story. Lockwood, Greene & Comapny are the engineers.

Lockwood, Greene & Company are preparing plans for the new mill of the Arcadia Manufacturing Company, Spartanburg, S. C., which will be 125 x 280 feet, three stories, mill construction. The initial installation will include 20,000 spindles, with plans for an ultimate equipment of 40,000 spindles. H. A. Ligon, Jr., vice president, is in charge. One hundred workers' homes will be constructed.

Clifton Manufacturing Co., Clifton, S. C., are erecting 50 cottages, as well as a commodious hotel building, and they also are enlarging their power plant.

A community house, of frame and brick construction, is being erected in the village of the Union Bleachery, Greenville, S. C., to be modern and up-to-date in every respect.

Sixty additional four- and five-room cottages are being erected by the Fort Mill Mfg. Co., Fort Mill, S. C.

American Spinning Co., Greenville, S. C., will erect a new picker house, to be 52 x 100 feet, one story, with basement. J. E. Sirrine & Company, of Greenville, are the engineers.

Cowpens Cotton Mills, Cowpens, S. C., are erecting a two-story addition, 53 x 100 feet, which will be used for slashing, tying-in, spooling and warping machinery, and 100 latest Draper looms. This company recently took out group insurance in the Metropolitan Life Insurance Company for its operatives.

Jackson Mills No. 2, Wellford, S. C., expect to have their Wellford plant in operation in May.

The bleachery to be erected by the Pacific Mills, at a location near Spartanburg, S. C., will have an initial capacity of more than 1,250,000 yards weekly, it is stated. A cotton mill with an initial installation of 32,000 spindles, which will be removed to South Carolina from the cotton department of the Pacific Mills at Lawrence, will be added. The community will be named Lyman in honor of the late Arthur T. Lyman, for many years president of the Pacific Mills. The cotton mill will be 300 x 135 feet, four stories, and a cotton store house building 75 x 100 feet will also be erected. The bleachery and finishing plant will be a five-story building, 650 x 200 feet, part two-story, part one-story, with power house and pump room building. Work was begun recently on 300 employees' houses in connection with this development.

The capacity of the Lydia Cotton Mills, Clinton, S. C., will be doubled, according to present plans, and the development will call for an expenditure of approximately $750,000. The mills now have a plant of 22,544 spindles and 500 looms.

A new mill capitalized at $200,000 and to contain 6,000 spindles will be erected at Kings Creek, S. C., by A. W. Love and associates. Mr. Love, who is one of King Creeks' leading business men and farmers, will be one of the largest stockholders; he states no New England capital is interested in the project, all the stockholders being from Cherokee, York and contiguous counties.

The Alma Mills, Gaffney, S. C., are to erect a plant for the manufacture of shade cloth. The building will be 105 x 228 feet, of brick and wood construction, and 15,000 spindles and 400 looms will be installed. Cost of machinery will be $300,000. J. E. Sirrine and Company are the engineers.

In addition to the weave shed being constructed as an addition to the plant, the Beaumont Manufacturing Company, Spartanburg, S. C., will build 50 four-room cottages for employees at a cost of $75,000.

Baldwin Cotton Mills, Chester, S. C., will build a new opener room and install new opening machinery. J. E. Sirrine & Company are the engineers.

The addition to the Palmetto Cotton Mills at Columbia, S. C., will comprise a three-story, 80 x 100 foot addition, in which 3,376 spindles and 112 looms will be installed.

Mollohon Manufacturing Company, Newberry, S. C., is

HUNDREDS of hurrying passersby pause before these little clocks in jewelers' windows—set their watches—and hasten on. They want the exact time—U. S. Observatory time. They see many other clocks, but this is the one they trust—they have found it a symbol of Reliability.

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Unique in the ingenious construction which makes cleaning of the interior simple and easy.

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Since 1888 reliable humidifying devices.

erecting a building for cloth room and cloth storage. J. E. Sirrine and Company are in charge.

Grendel Mills, Greenwood, S. C., will add 11,000 spindles with preparatory machinery, state J. E. Sirrine & Company, the engineers in charge.

Lockwood, Greene & Co., of Boston and Atlanta, have in charge, as architects and engineers, plans for a new $1,000,000 cotton mill at Camden, S. C., for which land adjacent to the present Wateree Mill site has been purchased. Hydro-electric power will be used.

Red Bank Mill, Lexington, S. C., will build a one-story, 80 x 100 foot addition, costing $20,000, in which 2,880 spindles and 112 looms will be installed. Machinery has been purchased.

Jenckes Spinning Company, Pawtucket, R. I., has completed negotiations for a five-year contract with the Aberthaw Construction Company, Atlanta and Boston, which embraces all construction work for the Jenckes Spinning Company in the South for the period named.

Nashville Cotton Mills, Nashville, Ga., have made application to the Georgia Public Service Commission for permission to sell $250,000 of 8 per cent cumulative preferred stock, with plans in view for the construction of a cotton mill. The promoters of the enterprise are J. H. Anderson, A. J. Connell, and L. A. Carter, all of Nashville, Ga. Mr. Anderson was made temporary president; with A. H. Giddens and J. W. E. Powell, vice presidents, and Dr. L. A. Carter, treasurer.

Announcement has been made of the sale of the Montala Cotton Mill Company, Montgomery, Ala., to the Elmore-Brame Cotton Co., of Montgomery, and other interests.

A 16-room school house is to be built at the Porterdale (Ga.) plant of the Bibb Manufacturing Company.

Russell Manufacturing Co., Alexander City, Ala., is installing 456 spindles at the Bettie Francis Mill, 456 spindles at the Roberta Mill and 456 spindles at the Russco Mills.

Mobile Cotton Mills, McComb, Miss., will add 43 looms for weaving narrow fabrics.

Ocilla Cotton Mills, Ocilla, Ga., of which H. E. Oxford is president, are planning a new mill of 10,000 spindles and 300 looms.

Fulton Bag & Cotton Mills, Atlanta, Ga., have been granted a permit to operate in Texas, which portends, according to rumor, the construction of a branch mill at Dallas.

Sibley Manufacturing Co., Augusta, Ga., is re-arranging the opening room and installing new machinery.

Dixie Spinning Mills, Chattanooga, Tenn., have increased their capital stock to $2,500,000 for carrying on expansion work.

Cotton Mill Products Company, Natchez, Miss., is installing additional spinning equipment and 40 new looms.

Elk Cotton Mills, Fayetteville, Tenn., have awarded contract for the construction of an addition to the present mill building, providing space for an increase in spindleage.

Industrial Cotton Mills, Eagle Lake, Texas, has been organized with a capital of $1,000,000. Its officers are: J. A. Dromgoole, president; G. W. Keith, vice president and general manager; H. B. Faber, secretary, and J. G. Thomas, treasurer.

Oakland Cotton Mills, Newberry, S. C., have taken initial steps toward the ultimate doubling of their mill. Lockwood, Greene & Co., engineers, Atlanta and Boston, are supervising the construction of the two additional sections now being added to the present two-story warehouse. Each section is 50 x 100 feet. The opener room is also being enlarged, and increases to the village and other extensions are under consideration.

Winnsboro (S. C.) Mills, operating a considerable part of the plant at night, are building 35 new houses to take care of the additional employees. Lockwood, Greene & Company have the work in charge. 26 of the houses will be of the double-four room type, and 9 are to be single houses with five rooms. They, like practically all of the houses in the Winnsboro village, are to be equipped with electric lights, water, and bath rooms.

Erection of a string of ten cotton mills in the Southwest is planned by the Consolidated Cotton Mills Co., Muskogee, Oklahoma, recently capitalized at $5,000,000. A majority of the mills, it is stated, will probably be erected in Texas, although plans call for one in Arkansas and one or more in Louisiana. The report states the company plans to manufacture a full line of fabrics from heavy duck to fine ginghams. R. H. Kagi, it is stated, will head the technical staff as vice president and general manager. Alvin C. Owsley, of Denton, Texas, father of the national commander of the American Legion, will serve the company as vice president and general counsel.

Complying with orders received from the owners, the Warner Division of the International Cotton Mills at Newburyport, Mass., close the plant permanently. The mills were to run until the supply of cotton on hand was used. Lockwood, Greene & Co., the owners, are quoted as saying, "we have decided that yarn for automobile tires such as is made at the Warner Division cannot possibly be manufactured in the North at a profit, and the company is now seeking an immediate location in the state of Georgia where the entire interests of the division will be removed."

Cedartown (Ga.) Cotton & Export Company are adding 12,000 spindles to the No. 2 mill and expect to still further increase this mill by putting in 9,000 more spindles; at the No. 1 mill 3,500 twister spindles are being added.

Walton Cotton Mills, Monroe, Ga., have authorized Lockwood, Greene & Company to make a layout for the future installation of 10,000 spindles, 5,000 of which are to be installed immediately. This order also includes the doubling of their mill village.

The New England Mill Situation.

Within another couple of weeks the textile mills and finishing plants of New England will be operating on a wage scale averaging 12½ per cent higher. Although this advance has been widely heralded in news and trade channels, prices have not advanced and in many instances they have declined. This development is the more annoying from the fact that the profit margin for manufacturing, based on cotton and costs, is not wide and in a great many cloths it is non-existent. The mills hesitate to contract ahead on staple goods at some of the lower prices recently quoted.

The time has come when it is imperative that some policy shall be adopted by mills to carry them through the critical months left of the cotton year, and the two months that

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Bonded for 20 and 10 Years

Barrett Specification Roof on Rolater Building. Cont.: P. L. Bottoms. Rfr.: James F. Devine, all of Oklahoma City.

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Magnolia Petroleum Filling Station. Arch.: Clarkson & Gomes, Dallas, Tex. Cont.: W. F. Lawrence, Oklahoma City. Rfr.: James F. Devine, Oklahoma City.

Oklahoma City's Roofs are Bonded—

Say "Oklahoma City" to the average man, and he at once thinks "oil." But this important oil city is also noted for its manufactures; its trade in cotton, grain and live stock.

Most of the substantial structures that house Oklahoma City's varied industries are covered with Barrett Specification Roofs—bonded against maintenance expense for a long period of years.

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That the roof was laid by a skillful, dependable roofing contractor;

That a Barrett Inspector saw the high grade pitch and felt called for by the Barrett Specification properly applied;

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Barrett Specification Roof on Southwestern Bell Telephone Co. Arch.: E. J. Peters, Shawnee, Okla. Cont.: Smiser Const. Co., Oklahoma City. Rfr.: James F. Devine, Oklahoma City.

Barrett Specification Roof on Jefferson School Building. Arch.: Layton, Smith & Forsythe. Cont.: C. M. Dunning Construction Co. Rfr. H. L. Turner Sheet Metal Co., all of Oklahoma City.

Barrett Specification Roof on Swift & Co. Building. Cont.: Swift & Co. Rfr.: James F. Devine, both of Oklahoma City.

Barrett Specification Roof on Mo., Kans. & Tex. R. R. Roundhouse. Cont.: H. D. McCoy, Cleburne, Tex. Rfr.: James F. Devine, Oklahoma City.

will intervene between August 1, and October 1, by which time the new cotton crop movement will be under way. The most recent statistics indicate that mills are supplied with cotton to July 1, at least. Many of course, are supplied beyond that period.

To meet the merchandising situation, some large units of production have been willing to sell their product ahead at current prices and will average their output by combining cotton in stock with any they may have to purchase later on. This was the case on Pepperell sheetings that were priced at 60 cents for 10-4 goods, after a price of 65 cents had been made on Mohawks, a somewhat similar construction. It is the manifest purpose, in naming a close price, to induce the placing of forward orders by the trade so that stocks will not accumulate in mill hands. Mills making ginghams, domets, flannellettes, blankets, and some other distinctly fall products, are of course, now well under order, with offerings withdrawn.

Owing to the very dull trade of the month, reports are heard of accumulations of stock in some lines. This is not general, however, as many mills are well sold up for the coming two or three months. At Fall River, the sales of the week ran down as low as 35,000 pieces, which is less than a day's output, and in New Bedford, sales of stock goods were light. Nothing in the way of pressure to sell has been seen and it is evident that stock accumulations are negligible thus far. The matter merely shows the tendency of mills in past months to sell as closely as possible up to the estimated output.

There have been many cases of overtime operations in some departments where it was desired to keep deliveries up but on the whole the policy of overtime operations has been discouraged in this section. Naturally, the overtime operations in the South have tended to supply the market fully and have lessened the chances for spot selling with the demand of a limited character, at best.

The latest reports of finishing plants showed that operations were increasing in everything save fast blacks, and they fell off only slightly. Job printers have been very busy on anything they could deliver within 60 days. The large printers are still running in full. The bleacheries have been lessening their output somewhat in the past two weeks or finding their forward orders shrinking. This is due to the very quiet trade in 4-4 bleached cottons. It is explained that the large use of colored lingerie for ladies' underwear is lessening the consumption of plain bleached goods very much.

Mills making heavy colored goods, such as tickings, denims, cheviots, and working suit goods, are now better sold than they have been for some time but are still working on very close margins. On bedspreads, the mills are comfortably sold and are now seeking later business. The towel trade has been quiet but mills are running in full.

The legislatures have adjourned without changing the status of the working hours. Massachusetts has refused to go back to a 54-hour week, but the New Hampshire and Rhode Island legislatures will not establish a 48-hour week. The United Textile Workers, a branch of the American Federation of Labor, is making many threats as an organization, against politicians who did not follow their suggestion of cutting down hours, but there is a stronger political sentiment growing in the section against penalizing New England industry still further.

The excessive taxation that is being imposed by municipalities on cotton mills is attracting a great deal of discussion as some of the mills are now contesting the assessments and hearings before court bodies are going on. The large cities continue to expend money liberally on public works and the burden of the taxation is falling upon the mills. So long as the mills are running and paying dividends it is difficult to arouse much public opinion against such a ruinous policy, but eventually, when the power to compete in the markets is imperilled, because of high fixed costs, it is believed that something will be done to prevent further attacks that will eventually drive industry out of the section.

At a recent gathering of merchants in Lawrence, where some manufacturers discussed their difficulties, it was apparent that it is not the intention of large corporations to abandon their investments. But they are seeking and demanding a degree of cooperation from citizens whose community interests are at stake to the end that outside agitators, in the name of unionism, shall not be encouraged to make further unfair demands and impositions. That the spirit of the community is changing is best shown by the admittance to wage conferences recently at Fall River, of a committee of citizens, who sought no power but who were asked to listen to the merits of the discussions as they went on.

Interest in the southern field as an investment for cotton mill and other textile properties has increased in New England and it is undoubtedly of a permanent character. It is taking the form now of investments through banking channels largely, but stocks of new companies are certain to be more widely distributed as a consequence of additions to southern investments now being made by New England companies. The idea of southern management, wherever possible, is welcomed, as it insures a community interest that will make the investments of a permanent character. Undoubtedly, capable southern mill managers, especially in the operating executive fields, will benefit from this tendency, as few New England bred men of the operating executive class care to live in the south, largely because of their feeling that climatic conditions are not agreeable.

From time to time complaints are heard of labor scarcity and this is unavoidable in the present unusual condition. Woolen, silk, and knit goods mills are running in full, so that cotton mills have no floating population to draw from. Moreover, the finishing plants, the machine shops, and the many miscellaneous yarn and supply mills are busy and workers can find employment readily at good wages. In the event of curtailment being forced by a slack market on a profitable basis, as some manufacturers are expecting throughout the summer, it is likely to be welcomed as a means of granting vacations to workers who insist upon their ease in summer whether times are good or bad.

The activity of machine shops is as great as the limited supply of skilled labor will permit. Many shops have all the business they want for this year. Most of the new machinery will go South where at least 1,500,000 spindles may be added in a twelvemonth. The shops making finishing machinery are receiving many inquiries of late from concerns that may eventually establish southern branches. They are almost wholly of a preliminary character.

A topic that is attracting much discussion here is a proposition to extend the activities of the government depart-

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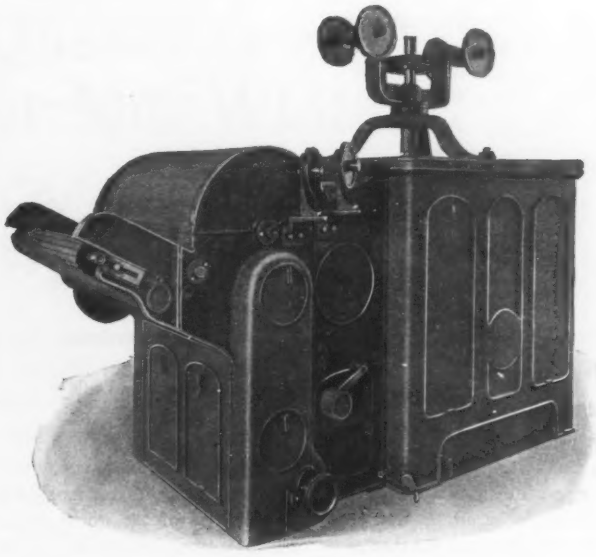

This illustration shows a single section "Crighton" Opener, complete with Balanced Rope Drive, Cage Section and Apron delivery. Machines are built without the Cage Section and Apron delivery when desired, and installations can be made with one, two or three "Crightons" in a line or section. We can also furnish direct belt drive, or individual motor drive

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ments in the work of gathering and disseminating facts concerning, production, distribution, and consumption of cotton goods. The proposition is not welcomed in many places but has found strong favor elsewhere. Many New England manufacturers and merchants already resent the constant growth of government interest in industry. It is one of the holdovers of the war that is not palatable. Many manufacturers took kindly to the inauguration of the open price association policy within the industry for the collection and dissemination of statistics but since the government has discouraged the private gathering of information, some of these organizations have ceased their activities.

The advantage of those associations over any organization the government can bring together is obvious, in that men in the industry itself were to deal with the figures. If the government bureaus are intrusted with the work of gathering and distributing figures, they will be circulated weeks after being submitted, and will be subject to untrained diagnosis. Moreover, the inherent desire of Americans to have less of government and more of individual or collective trade initiative is very strong in this section. The extra cost of imposing such work on the government and upon mill office forces, has not been mentioned.

At this time opinion here concerning market prospects is widely divided. Cotton may be lower in the fall and if so, lower prices for goods will be expected. Buyers are not disposed as a rule to move far ahead, and mills having limited cotton supplies are also conservatively inclined. Goods are going to cost more, and thus far the retailer of the country is not dealing with the high priced merchandise made and sold in the past three months. Will the public pay still higher prices?

Cotton Comment.

BY H. & B. BEER.

New Orleans, April 14th, 1923.

Although statistical developments during the past month have been bullish and in keeping with expectations for virtually a famine in American raw cotton before the new crop moves in volume to market, and the fact that weather conditions have not been altogether satisfactory; too wet and cold, the tendency of the market has been downward because of the failure of the spot demand to revive and owing to a slowing down in the demand for cotton goods.

The fact that the price of contract cotton, even for new crops, is still comparatively high, discouraged speculation in view of prospects for a larger crop this year for next season's requirements and the less urgent trade demand. As a result the market has been in process of liquidation, resulting in the lower prices established.

Under the circumstances the course of values was disappointing to owners of spot cotton, especially since the weather has been rather unfavorable for new crop preparations, and the planters of the interior complaining of a shortage of farm labor. So far it is reported that very little progress has been made in planting corn or cotton, and some replanting was made necessary in the early coast districts of Texas and Georgia and in some districts of South Carolina because of low temperatures.

Sales of fertilizer in the cotton region for March were not as large as expected, in fact were somewhat less than for the corresponding month last year—767,020 tons vs. 811,609, but the total for 8 months to the close of March is much larger than last season—2,107,387 tons vs. 1,365,210 last year and 2,679,817 in 1920 when the last good crop was made.

According to the Census Bureau, consumption during March by American mills was the largest for any month on record, even eclipsing the heavy consumption for the corresponding month during the world war period, amounting to 623,000 bales vs. 520,000 last year, linters excluded.

Compared with last season domestic mills consumed during March, including linters, 675,000 bales vs. 568,000 last year, and for the first 8 months of the season 4,899,000 bales against 4,424,000.

Last season domestic mills consumed, including linters, 6,234,000 bales, and as domestic consumption, so far this season, of American cotton, is 475,000 larger than last year, indications are that American mills will continue to use more cotton than last year as the number of active spindles in the United States at the close of March was 35,501,000 against 31,873,000 one year ago.

COMPARATIVE STOCKS. (CENSUS REPORT.)		
United States, March 31st:	This Year	Last Year
Mill stocks	2,035,000	1,557,000
Stocks in public storage	2,378,000	3,752,000
Total stock	4,413,000	5,309,000

While American mills appear to be pretty well provided with stocks of the raw material, especially southern spinners, European mills are not so well off, the available, exclusive of mill stocks, as will be seen by the following comparatives, is very small:

April 13th	This Year	Last Year
Remaining to be marketed	1,748,000	3,811,000
U. S. ports stocks	545,000	1,003,000
European stocks and afloat from the U. S.	875,000	1,461,000
Total	3,168,000	6,275,000
Spinners takings after April 13th	(?)	3,210,000

Spinners of the world continue to take freely of American cotton, last week 177,000 vs. 144,000 last season, since August 1st, 9,802,000 against 9,874,000. Spinners' takings since August 1st, are now only 72,000 less than last season, and as takings for the whole of last season were 13,084,000 bales, they are now running on a basis for the whole of this season of 13,012,000.

It is evident, therefore, there is an opportunity for interesting developments to come of the bullish supply situation before the new crop has a chance to move in volume to market.

The 17th annual convention of The Cotton Manufacturers' Association of North Carolina will be held in Winston-Salem, N. C., on Friday and Saturday, June 15th and 16th, at the Robert E. Lee Hotel, according to announcement made by Secretary Hunter Marshall, Jr.

An attractive program is being arranged, and in addition special preparations are being made by the golf clubs in Winston-Salem for the entertainment of the convention.

A full representation of the membership is urged. J. H. Webb is president of the association. Bernard M. Cone, is first vice president.

Three Questions to Ask About Mill White:

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Wahcolite is the perfect white finish for walls and ceilings of mills, factories and warehouses. It magnifies the power of daylight, and distributes it evenly to the darkest corners. It keeps daylight on the job more hours per day. Comparative tests have proved the greater refractive powers of Wahcolite.

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THE BAY STATER

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Notes About Men You Know.

A. T. QUANTZ, general superintendent of the Arcade Cotton Mills and Aragon Cotton Mills, Rock Hill, S. C., has been made president of the Glenn-Lowry Manufacturing Company, at Whitmire, S. C. Mr. Quantz is one of the best known operating executives in this section, having formerly been chairman of the weavers' division of the Southern Textile Association, and his many friends note his selection to this important position with interest. He will retain his connection with the Rock Hill plants, and will continue to reside there, it is announced.

L. E. BEARD, formerly conected with the Baldwin Mill, Chester, S. C., has been selected as secretary-treasurer of the Glenn-Lowry Manufacturing Company. The vacancy at the Baldwin Mill will be filled by John G. Barnwell, who has been secretary of the Aragon Cotton Mill for some years. E. O. Hull becomes secretary at the Aragon, and Mr. Hull's former position as assistant secretary is being taken by George Carlisle.

LEONARD S. LITTLE, formerly assistant superintendent at the Pacific Print Works, Lawrence, Mass., has been appointed general superintendent of the new mill and bleachery to be erected at Lyman, S. C., by the Pacific Mills.

N. H. WELCH has been named as superintendent of the Florence Mills, Inc., Forest City, N. C., to succeed I. B. Covington, resigned, who goes to Wadesboro as general manager of the new Wadesboro Manufacturing Company about September 1. Mr. Welch has been connected with the Florence Mills for about twelve years.

CALVIN E. SWEET, formerly superintendent of the Natick Mill of B. B. & R. Knight, Inc., at Natick, R. I., has been made assistant general manager of the company's properties, and has been transferred to the office of General Manager F. L. Branson at Providence. Other promotions and changes in the organization's operating force were as follows: James L. Harring, superintendent at the Dartmouth Manufacturing Company, New Bedford, Mass., succeeded Mr. Sweet at Natick. John A. Crossland, superintendent of the Clinton Mill, Woonsocket, became superintendent of the Centreville Mill, and William E. Sykes became superintendent of the Arctic Mill. Frank Deary, overseer of carding at the Natick Mill, is now superintendent of the Clinton Mill; Richard Fleet, formerly overseer of carding at Centreville, takes that position at the Natick Mill; Frank Fortin, formerly at the Grant Mill, is overseer of carding at the Centreville Mill; and Charles E. Young, of Pawtucket, succeeds Mr. Fortin as overseer of carding at the Grant Mill.

D. E. ELMORE, who has been overseer of carding at the China Grove (N. C.) Mills, has accepted a similar position at the Winget Mills, Gastonia, N. C.

C. A. FOX has resigned as assistant superintendent of the Spencer Mills, Spindale, N. C., to become superintendent of the Hall-Kale Manufacturing Company, Troutman, N. C.

D. C. ANDERSON, recently second hand in spininng at The Dixie Cotton Mills, La Grange, Ga., has become overseer of carding and spinning at the Tennille (Ga.) Yarn Mills.

P. G. HOUSER has resigned his position with the Sylvan Cotton Mills, Shelbyville, Tenn., and, with his brother, has organized the Houser Textile Company, Nashville, Tenn., selling agents for hosiery, underwear and blankets.

CLARENCE BERNARD BRYANT, of Charlotte, N. C., for many years secretary of the American Cotton Manufacturers' Association, died on Wednesday, March 28, at the age of 48 years. Mr. Bryant, one of the best known men in the southern textile industry, was at the time of his death the Charlotte representative of George H. McFadden & Brother, and president of the Charlotte Cotton Compress Co., and the Charlotte Bonded Warehouse Company, and the Charlotte Investment Company and other important organizations. He served as secretary of the American Cotton Manufacturers' Association for 17 years, being succeeded several years ago by Winston D. Adams, the present secretary.

N. C. HILL has resigned his position with the West Huntsville Cotton Mill and is now overseer of night spinning at The Lowe Manufacturing Company, Huntsville, Ala., succeeding J. T. Tucker, resigned.

S. WILLARD JACOBS has succeeded D. K. Bartlett as general sales manager of the Electro Bleaching Gas Company, New York City. Mr. Jacobs is a chemical engineer of extensive training and has done much to advance the use of liquid chlorine. Aside from his work as consultant on matters pertinent to the use of this chemical, he has supervised the installation of a number of chlorine plants and has gained a considerable reputation because of his ability in this field. His office will continue to be at the main office of the company, 18 East 41st St., New York City.

HUGH BALLARD has become night overseer of spinning at the Linford Mills, Belmont, N. C.

In these columns last month it was stated through error that E. R. Lehman, who recently became assistant superintendent of The Dixie Cotton Mills, La Grange, Ga., has been overseer of carding at the Shawmut Mill, Shawmut, Ala. C. A. Singleterry is overseer of carding at the Shawmut Mill, having held this position for the past ten years. Mr. Lehman's position at Shawmut was second hand of carding.

R. J. Doss has resigned as overseer of spinning, spooling, twisting, warping and winding at the Elk Cotton Mills, Dalton, Ga. G. W. Buchanan has resigned as second hand in spooling, spinning, warping and twisting at the Elk Mill, and has accepted a position at the No. 1 Mill of the Kincaid Mfg. Co., Griffin, Ga.

B. H. WHITE has been promoted to night overseer of spinning at the Elk Cotton Mills, Dalton. J. T. Huff has been transferred from overseer of spinning at night to day overseer of spinning at the Elk Cotton Mills. R. J. Buchanan has been promoted to second hand in spinning at night at the Elk Cotton Mills.

P. J. SPRAYBERRY has resigned as overseer of carding at the Elk Cotton Mills, Dalton, Ga.

J. D. SMITH has been promoted from second hand to overseer of spinning at the Swift Manufacturing Company, Columbus, Georgia.

Trim as an Athlete

—and just as sturdy and capable is this Tolhurst Direct Motor Driven Extractor.

Note its trim, clean cut appearance. The design is simple and absolutely free from complicated parts and accessories that interfere with easy operation and that collect dirt and grease—

—and its accomplishment is unsurpassed. Here you have all the flexibility of a motor driven machine—compactness, simplicity, and economy of operation—rapid acceleration and braking—easy loading and emptying—large capacity loads—self adjusting of load—absence of vibration—low upkeep cost—and long life. The guard is simple and effective—does not interfere with view of interior and loading or unloading. Brakes and guards are interconnected with motor circuit.

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TOLHURST

REG. U. S. PAT. OFF.

EXTRACTORS

WILLIAM R. MCELVEEN has become overseer of weaving at the Peerless Cotton Mills, Thomaston, Ga.

F. L. BUMGARDNER has been promoted to night overseer of spinning at the Climax Spinning Company, Belmont, N. C.

J. W. ALLEN, formerly at the Mobile (Ala.) Cotton Mills, has become overseer of spinning at the Alexander City (Ala.) plant of the Avondale Mills.

G. H. SMITH has become overseer of carding at the Delburg Mills, Davidson, N. C.

W. F. BALLARD has been transferred from night superintendent to overseer of carding on the day run at the China Grove (N. C.) Mills.

J. W. BLACK has resigned as superintendent of the Harmony Grove Mills, Commerce, Ga., and has been succeeded by J. J. Donaldson.

JAMES E. FIELDS has been made night superintendent at the Standard Cotton Mills, Cedartown, Ga.

J. T. REEVES has become overseer of carding at Mill No. 1 of the Bibb Manufacturing Company, Macon, Ga. He was formerly overseer of carding at the Ensign Mill, at Forsyth.

J. B. THREATT, formerly at Lancaster, S. C., has been made overseer of carding at the Chadwick-Hoskins Mill No. 5, at Pineville, N. C., succeeding M. Williams, resigned.

W. M. SUTTLE has become overseer of spinning at the No. 1 Mill of the Lancaster (S. C.) Cotton Mills.

W. B. CASH, formerly overseer of weaving at the Gambrill & Melville Mills, Bessemer City, N. C., is now night overseer of weaving at the Cabarrus Mills, Kannapolis, N. C.

L. M. RHYNE has been promoted to night overseer of carding and spinning at the Long Shoals Mills, Long Shoals, N. C.

JOHN H. QUINLAN, general manager and vice president of the Cedartown Cotton & Export Company, Cedartown, Ga., together with Mrs. Quinlan, is planning an extended vacation, to include a trip to California, taking in the points of interest on the Pacific slope and other places.

H. B. MILLER, for several years superintendent of the Ashcraft Cotton Mills, Florence, Ala., and more recently connected with the Swift Mfg. Co., has been made superintendent of the Aponaug Mfg. Co., Kosciusko, Miss.

DEAN SUTCLIFFE, superintendent of the Couch Mills at Thomaston, Ga., has also been made superintendent of Couch Mills, Inc., East Point, Ga., succeeding W. E. Tisdale, resigned.

W. H. BURKS has been appointed superintendent of the Yazoo Yarn Mills, Yazoo City, Miss.

R. C. RICE is now night overseer of carding at the China Grove (N. C.) Mills.

F. Y. HAMBRICK has been promoted from second hand to overseer of weaving at The Florence Mills, Forest City, N. C., succeeding N. H. Welch, who has been named superintendent.

FREDERICK W. BRADLEY, New England manager of Borne, Scrymser Company, New York, Boston and Philadelphia, died suddenly at his office, 36 Central Wharf, Boston, on March 20th. Mr. Bradley has been manager at Boston since the branch was started, and was a recognized expert on lubrication. He was a graduate of the Massachusetts Institute of Technology, Class of 1889 Electrical Engineering.

A. C. M. A. Meeting in Richmond May 16-17.

Three southern governors will speak on the program of the annual meeting of the American Cotton Manufacturers' Association, to be held at the Jefferson Hotel, Richmond, Virginia, on Wednesday and Thursday, May 16 and 17. One of the subjects to which this association is just now directing special attention is the establishment of the closest and most sympathetic relations between the industry and the governing authorities of the several southern states.

Added interest centers in the meeting also, by reason of other vital questions that will be considered, including doubtless some discussion on the probable effect of the reported migration of New England capital South, on existing labor conditions and the future labor supply. Another feature will be the consideration of additional steps looking toward the relief of the southern industry from dependence on outside factors; the effort of the national congress for federal regulation of minors in industry, etc.

The annual election of officers will be made at this meeting. C. E. Hutchison, president of the American Yarn and Processing Company, Mount Holly, N. C., as president of the Association, will be the presiding officer.

One notable feature of the convention will be the annual banquet which will be held at the Jefferson Hotel, on Wednesday evening, May 16. Governor E. Lee Trinkle, of Virginia, and Hon. Edward James Cattell, of Philadelphia, will be the principal speakers of the occasion.

Secretary Winston D. Adams announces that all indications point to an unusually representative attendance at this convention. A large number of rooms were reserved for delegates at three hotels in addition to the convention headquarters, and these were being taken up rapidly. While the convention headquarters will be at the Jefferson Hotel, it is announced, a 2½-minute automoblie bus line service, operating day and night, will carry delegates from the Richmond, Murphy and Rueger hotels to the Jefferson, providing easy communication between these hotels and convention headquarters.

The United States Civil Service Commission announces the following open competitive examination for a Junior in Cotton Testing. The examination will be held throughout the country on June 6. It is to fill vacancies in the Bureau of Agricultural Economics, Department of Agriculture, at Washington, D. C., at entrance salaries ranging from $1,200 to $1,800 a year, plus the increase of $20 a month granted by Congress.

The duties of the position are to supervise or assist in investigations and mill tests relating to waste content, tensile strength, and other manufacturing and bleaching qualities of the various grades, qualities, and varieties of cotton, and also to assist in the cotton grading and standardization work of the Department.

The examination will consist of practical questions relative to the duties of the position, a thesis, to be submitted to the examiner on the day of the examination, and a rating on education, experience, and fitness. Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil service examiners at the post office or customhouse in any city.

INTANGIBLES IN MANUFACTURING

A Series by

Frederick H. McDonald

Where the Responsibility Lies

Questions for Board Room Discussion

There is a great tendency on the part of the financially concerned side of industry to attempt to separate the Plant from the Board of Directors' table.

Good machinery is provided, a good superintendent or manager is obtained—and the owners go off and forget the whole proposition until the question of dividends comes up. When there aren't any, they fire the manager, hire a new one, elect another president, rearrange the machinery, or perform some other local operation on the mill or its immediate management.

Like a bad appendix, plant disorders arise from causes that are seldom visible—a lot of them are as hereditary with a given proposition, run with given policies in a given location, as are the most virulent of human diseases.

The advantages a mill enjoys over its competitors or the disadvantages from which it suffers, result as much from the intangible influences that surround it, as from the efficiency or lack of efficiency of its operation.

Haphazard location—snap judgment on types of product—ignorance of market possibilities or demands—raw material wrong, or bought in wrong places—inadequate or expensive methods of transportation to and from the mill—lack of analysis of power requirements, with comparison of sources—there are dozens of factors that once a plant is located and put into operation on a particular product, are as fixed as fate in their influences on the cost of the product and the ease with which it can be sold.

The time to assure their being favorable is before the plant is started. In existing plants, study and analysis will often help in correcting them.

But they are essentially problems of policy—not of direct administration.

And the men who put up the money are the men who have got to look out for them—the man who spends the money is hog-tied before he starts.

[Note. This series will cover some of these intangible influences that make so much of the success of a plant the direct responsibility of its higher management.]

Eight Big Plants Stand Back of U S B & S Co. Products

Eight big factories with their combined immense resources stand squarely behind the quality of every U S B & S Co. product. The mill who purchases any product bearing this name KNOWS that it MUST live up to the reputation for quality and satisfacton which has characterized U S B & S Co. products since the first.

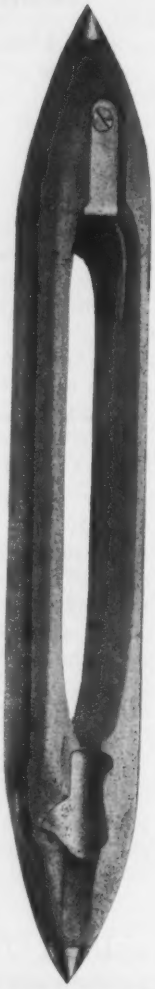
This immense organization, with its wide experience, more expert workmen and vast resources are able to turn out higher quality textile products at lower cost than any other manufacturer of like products. Today, U S B & S Co. products are considered the standard the world over.

U S Bobbins, designed by practical men with long experience, are stronger, lighter, and absolutely smooth and true. A system of testing every bobbin on your own spindles eliminates any that do not run true.

The "Stetson" Hand Threading Shuttle is another famous U S product —the best exponent of the hand threading type of shuttle that has ever been put on a loom. U S Shuttles are made in every type for Draper, Stafford and Crompton & Knowles Looms.

Automatic loom users who have not already adopted our remarkable new "S EYE Automatic Shuttle" have only to try it, as a trial has convinced the most skeptical that it is the best automatic shuttle ever made for any kind of automatic loom. Several loom builders have approved the "S Eye" Shuttle, realizing that its simplicity, ease in positive threading, unform tension and freedom from unthreading, misthreads, mispicks and broken picks are good reasons why a weaver of first quality can afford to use no other.

A sample of any U S product will be gladly sent on request. Ask today for catalog.



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	Twister	TWISTERS	Winder
SHUTTLES	Jack	TRIPTODS	
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U S BOBBIN & SHUTTLE Co.

LARGEST BOBBIN and SHUTTLE MANUFACTURERS in the WORLD

Eight Factories

Providence R.I.

AN OLD TIMER SAYS

There are three types of men who claim to be overseers and superintendents.

The first type may be compared to the oldfashioned derringer pistol. The derringer, you know, carried *one* cartridge. It either hit or missed in a single shot.

The second type may be compared to the revolver that has more cartridges, limited, however, to six or seven shots; the number that the revolving drum will hold.

The third type of overseer or superintendent may be compared to the modern automatic which carries clips of shells in the stock and these are fed out by the recoil of the shell just fired. It is capable of keeping up the shooting until it hits the mark.

Now, my dear brother overseer or superintendent, to which class do you belong? Are you the one-shot derringer, the five- or six-shot revolver, or the modern automatic?

Do you keep *everlastingly* at it until you accomplish what you set out to do? Do you take one shot at trying to beat that old record of production, and then quit or forget it? Do you try it for a few times and then give it up as a bad job, fooling yourself into the thought that you have tried pretty hard? Well, if you do, "Old-Timer" is right now giving you fair warning—some of these days one of those modern automatics is going to draw that same pay envelope or check that looks so good to you and furnishes gas for the tin lizzie.

Read the lives of great men and you will find one quality common to all of them. One man may be an inventive genius like Edison, another may be a great lawyer, another a captain of industry, but a close study will reveal the fact that they all have that one quality in common—that bull-dog tenacity to never give up, but to keep persistently at what they are aiming at until they hit the mark.

Some men are so doggone weak in this line that they should be wearing dresses instead of trying to pass themselves off as men. The very word "man" signifies strength—endurance—will power. Without such qualities you will never be the big man in the cotton mill business or any other business that your dreams have pictured that you would like to be. Dreams? Yes, imagination, if you prefer to call it that.

No man with any aspirations to amount to anything has ever risen above the crowd without dreaming, without the imagination to spur him on to the things he can picture in his mind.

An overseer or a superintendent with a small room or a small mill who does not dream or imagine how he would feel, how he would act, how he would manage, if he had a large mill or room, will never reach that goal.

No man will ever save any money until he begins to think of what he would do with the money if he had it. Neither will he ever be able to do those things unless he actually put away the first dollar, and then begins to add to it regularly every payday.

You certainly will never get to a place unless you start.

So it is with that better job. The real, honest-to-goodness desire has got to be born in you first; then you certainly must make a start, and the very best start "Old-Timer" has ever seen any man make is to run the dickens out of the job he now has.

That is the surest way I know of to get started toward promotion.

If you were going to promote one of your section men to second hand tomorrow, it wouldn't take you ten minutes to decide which man you would give the job to, would it?

And may I ask just why you could make up your mind so quickly?

Very likely you will answer, "Because he is the best section man I have; because he runs his job better than the other section men; because I can *depend* upon him. I know he will run the job the very best he can when I am not there," etc.

Now when a superintendent is looking for an overseer for that big room—when the president is looking for a superintendent for that big mill—

Good Lord, man, what's the matter with you, anyhow? Where's your thinker?

Ever here about that road to success? Well, a "feller" who has just been over it gave me a tip. Better take your chains along, he says, there are some pretty slippery places.

The average man in college only puts in about 750 to 850 hours of actual study per term of nine months. Any man who really wants to gain an education—a textile education or any other kind—can make that many hours of study in a year at night in his own home. You can get what the college man is getting if you have got the *backbone*.

If you know so much more than the boss, why not tell *him* about it instead of telling everybody else?

Remember, the man who can't save a cent can't put up much of an argument to his employer about how he can save for him.

We all know that in the year 1923 many good jobs will come open. Have you prepared yourself for one of them?

Does It?

It *should.* If it is *right,* it *will*

Does your Cost System give you up-to-date costs, not merely history?

Does it aid in stabilizing your wages and piece-work rates?

Does it point out defects in your routing system?

Does it help you maintain a perpetual inventory?

Does it increase your production?

Does it measure your overhead?

Does it detect new overhead expenses?

Does it point out leaks in expense?

Does it encourage your employees?

Does it promote intelligent competition?

Does it point to non-profit paying lines?

Does it permit you to bid safely?

This dozen "does its?" are questions for testing the value of a Cost Accounting System as set down by the experts of the Fabricated Production Department of the Chamber of Commerce of the United States. Most Cost Systems function perfectly along one or more of these requirements. Is your Cost System hitting on all twelve? It *should.* If it is *right* it *will.*

Our Cost experts—trained accountants with wide and practical experience in many fields of production are at your service—to check up, or to apply anew Straight Line Methods of Cost Accounting. They are available at all our offices.

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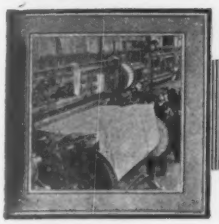
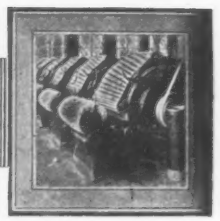


How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects



Asks for Information on 50s Yarn.

EDITOR COTTON:

Please have some of your readers send in for publication a complete lay-out for 50s warp yarn made from 1⅜ to 1¼-inch middling cotton, starting with the pickers and following every machine right up to the finished yarn, giving the settings, speeds, drafts and the amount of twist for each process. W. M. (Mass.)

Some Costs and Hang-Ups for 50s Yarn.

EDITOR COTTON:

This article follows my recent one in which I pointed out the difference in labor costs in using three and four processes of roving in making yarns above 50s, and now I will show that it is cheaper to make 50s yarn from 8 hank roving than from 10 hank roving. Of course, this illustrates only one case in which a manufacturer may reduce his labor costs, but if this is true with 50s, it is naturally true with many other counts. Besides showing the difference in labor costs, I will also give a good method of laying out drafts and weights in order to make a desired count. This method saves a lot of guesswork and figuring and should be very helpful to those who have charge of the yarn organization in the mill.

We will start with a 12-ounce lap at the back of the card, allowing five per cent waste at the card, using three processes of drawing, doubling six on each and using three processes of roving, doubling two on the intermediate and jack. We will take up the 10 hank first:

$$\frac{12 \times 437.5}{8.33} = 5250 \text{ grain lap.}$$

$$\frac{5250}{} = .00158 \text{ hank lap.}$$

$$\frac{\text{hank} \times \text{doublings} - 5 \text{ per cent waste at card}}{\text{hank lap}}$$

$$\frac{10 \times 6 \times 6 \times 6 \times 1 \times 2 \times 2 \times .95}{.00158} = 5{,}194{,}936 \text{ total draft}$$

$$100 \times 6 \times 6 \times 6 \times 4.5 \times 6.5 \times 7.5 = 4{,}738{,}500 \text{ trial draft.}$$

$$\frac{5{,}194{,}936}{4{,}738{,}500} = 1.0196 \text{ increased draft to be added to the trial draft.}$$

We will then increase the last process of drawing to 6.5 draft, then:

$$\frac{1.0196 \times 6}{6.5} = 1.011 \text{ increase left}$$

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

We will put the remainder of the increase on the jack, then: $1.011 \times 7.5 = 7.59$ draft required on the jack frame.

The correct drafts on the various machines starting with the card are, now: 100, 6, 6, 6.5, 4.5, 6.5, 7.59.

$$\frac{5250 \times .95}{100} = 49.87 \text{ or } 50 \text{ grain sliver at the card.}$$

$$\frac{50 \times 6}{6} = 50 \text{ grain sliver at the first and second drawing.}$$

$$\frac{50 \times 6}{6.5} = 46.1 \text{ grain sliver at the third drawing.}$$

$$\frac{8.33}{46.1} = .181 \text{ hank sliver.}$$

$$.181 \times 4.5 = .8145 \text{ hank at slubber.}$$

$$\frac{.8145 \times 6.5}{2} = 2.647 \text{ hank at the intermediate.}$$

$$\frac{2.647 \times 7.59}{2} = 9.99 \text{ or } 10 \text{ hank at the jack frame.}$$

The organization of the 8 hank is as follows:

$$\frac{12 \times 437.5}{8.33} = 5250 \text{ grain lap.}$$

$$\frac{5250}{} = .00158 \text{ hank lap.}$$

$$\frac{8 \times 6 \times 6 \times 6 \times 2 \times 2 \times .95}{.00158} = 4{,}155{,}949 \text{ total draft required}$$

$$100 \times 6 \times 6 \times 6 \times 4.5 \times 6.5 \times 7.5 = 4{,}738{,}500 \text{ trial draft.}$$

$$\frac{4{,}738{,}500}{4{,}155{,}949} = 1.11 \text{ decrease to be taken from the trial draft.}$$

As the decrease is small, we can decrease the draft on one machine, say, the slubber:

$$\frac{4.5}{1.11} = 4.05 \text{ draft required on the slubber.}$$

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QUALITY

LEATHER

Lug straps made of the famous hairy Bondaron Leather have positively proved their ability to *economically outlast* other straps several times over.

Now, note again the above phraseology—*to economically outlast*—by that we mean Bondaron Lug Straps do more than simply wear longer than other straps. They reduce picker stick breakage to a minimum and save the time and expense of extra labor and a costly idle loom. In short, they correctly speed your production.

"There is no time like the present"—tear off the attached coupon fill in your requirements, sign it and send it to your purchasing agent as a memo. Obey that impulse, NOW!

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Textile Leathers

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Purchasing Department:

Dear Sirs:

Please order at once.....

Bondaron Lug Straps from the manufacturers.

Charles Bond Company
617-619 Arch Street,
Philadelphia, Penna.

.....
Signature.

The correct drafts now are: 100, 6, 6, 6, 4.05, 6.5, 7.5.

$$\frac{5250 \times .95}{100} = 49.87 \text{ or } 50 \text{ grain sliver at the card.}$$

$$\frac{50 \times 6}{6} = 50 \text{ grain sliver at the drawings.}$$

$$\frac{8.33}{50} = .166 \text{ hank sliver.}$$

$$.166 \times 4.05 = .672 \text{ hank at the slubber.}$$

$$\frac{.672 \times 6.5}{2} = 2.18 \text{ hank at the intermediate.}$$

$$\frac{2.18 \times 7.5}{2} = 8.1 \text{ or } 8 \text{ hank at the jack frame.}$$

For the 10 hank the production and cost is respectively, as follows: picker, 221 pounds at $0.002026 per pound; card, 7.72 pounds at $0.005508 per pound; third process drawing 13.2 pounds at $0.001490 per pound (cost includes all three processes); slubber, 1.22 pounds at $0.003279 per pound; intermediate, 3.6 pounds at $0.008149 per pound; jack, .065 pound at $0.016300 per pound. The total cost is $0.036752 per pound.

For the 8 hank the production and cost is respectively as follows: picker, 221 pounds at $0.002026 per pound; card, 7.72 pounds at $0.005508 per pound; third process drawing, 14.35 pounds at $0.001370 per pound (cost includes all three processes); slubber, 1.62 pounds at $0.002465 per pound; intermediate, 4.78 pounds at $0.006130 per pound; jack, .093 pound at $0.010590 per pound. The total cost is $0.028089 per pound.

The production and cost of spinning will be the same in both instances, because the counts are the same and need not enter into the calculation. From these two comparisons we see that it is 23.57 per cent cheaper to make 50s from 8 hank roving than from 10 hank roving, or in other words if a mill is making 50s yarn from 10 hank roving it is losing nearly 24 cents on the dollar. N. B. M. (Mass.)

Testing the Individual Yards of a Lap.

EDITOR COTTON:

What is the value of testing the individual yards of a lap when the yardage and weight in the bulk are correct, asked "P. (Ala.)" in the February issue.

If we do not weigh the individual yards of a lap, how do we know the laps are running uniform? To go to the extreme, some yards may weigh 16 ounces and others 8 ounces but still the lap in the bulk weighs 42 pounds.

The evenness of the yarn or cloth is determined to a great extent by the evenness of the finisher lap. If the individual yards of a lap from each finisher are not tested from time to time it will be found that the eveners will not be kept in the best working order and much variation will be allowed to remain in the finished product which could be eliminated.

After the stock leaves the drawing frames there is comparatively little more doubling and evening done in the subsequent processes. Two processes of drawing with six ends up at the back will do only a certain amount of evening. The more even the finished lap the less variation in card sliver, finished drawing and following processes.

Uneven yarn is not as strong as even yarn and the appearance is not so good. It is impossible to make a yarn as smooth and even from laps with wide variations in the weight of individual yards as from laps with the variation reduced to the minimum.

The machines in the mill are set for a given number of pounds of production per day and weights per yard. If the finished laps are not tested from time to time for variations in individual yards, I venture to say there is as much as 25 per cent variation and probably more. This would mean several yards weighing 12 per cent over and several 12 per cent under standard.

Suppose the cards are geared to produce 150 pounds per day of ten hours from a 12½-ounce lap. When the heavy yard is going through the card we are then carding at the rate of 168¾ pounds per day. It is certain we will not card as well at that rate as at 150 pounds per day. When we are carding the light yards we are carding at the rate of only 131¼ pounds per day. The card will do its work at this rate much better than at 168¾ pounds per day.

The same argument advanced for the cards will apply to other machines in the mill which clean or draft the stock. It is undoubtedly true that better yarn or cloth would be produced if each inch, yard and hank of laps, sliver and roving could be manufactured in such a way as to weigh exactly what it should without variation.

In writing the foregoing, it is admitted that greater variation is found in the weight of card sliver after stripping and after new laps are pieced in, which can be controlled only to a certain extent. But why should pickers be allowed to make laps with a wide variation in the weight per yard when the eveners can be adjusted to control the variation within narrow limits?

In direct answer to "P. (Ala.)," the same standard of quality cannot be attained by not weighing (testing) as by weighing (testing) the individual yards of finisher laps.

Nemo (Ga.

Keeping on the Numbers.

EDITOR COTTON:

How many superintendents and overseers know exactly how their work is running every day? How many can tell at a moment's notice whether the jack frames are runnin light or heavy?

We use a system that I think is about as good as any I have seen, so I will try to explain it so that it may be passed on to others who can use it if they wish.

Every day we have all of our work sized from the finisher pickers to the ball warpers, so we can follow the work as it goes along. You will notice that the accompanying table is divided with squares, each one representing a week's sizing of a certain process. There are three divisions in these squares so that the high, low and average may be recorded each day and each week.

All sizing up to the spinning frames is taken at random through the department. We take ten jack frame bobbins and record their high and low and their average, so as to be sure we have the room's average since these bobbins are

His work begins

KEEP him out. Safeguard your property.

Surround your plant with that never-failing barrier against sneak thief, night prowler, and other dangerous trespasser—a sturdy, impenetrable, unclimbable Anchor Post Fence.

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STOCK B 1 1/8"	PICKER 12oz.			CARD 55 GR.			DRAWING 62			SLUBBER .48			INTER. 1.10			FLY 2.57		
1923	H	L	A	H	L	A	H	L	A	H	L	A	H	L	A	H	L	A
FEB. 5	43.5	42.5	43.0	57.9	52.5	55.2	63.1	62.0	62.5	.49	.48	.48	1.17	1.12	1.14	2.61	2.53	2.57
6																		
7																		
8																		
9																		
WEEKLY AV.	43.5	42.5	43.0	57.9	52.5	55.2	63.1	62.0	62.5	.49	.48	.48	1.17	1.12	1.14	2.61	2.53	2.57
FEB. 12																		
13																		
14																		
15																		
16																		
WEEKLY AV.																		

picked up at random. Then if the work starts to run heavy we know that the whole room is going heavy.

After sizing these ten bobbins we take them up to the spinning room and have them spun, then the next day we size the yarns spun from these ten bobbins. Not being satisfied with that we take ten more spinning bobbins picked up over the room and size them both for numbers and for break, to be sure we have the general average.

On our ball warpers we take three warps and set down the high, low and average. Our rule for finding numbers on the ball warpers is:

$$\frac{\textit{Number of ends} \times \textit{number of yards}}{\textit{Net weight} \times 840 \textit{ yards}}$$

In the mill to which I have reference it takes ten days for work to get from the drawing frames to the ball warps, so we draw a line diagonally across our chart starting at our drawing frame sizing and ending ten lines below at our sizing for ball warps—thus we know what our work is doing and when and where it is light or heavy.

We are spinning numbers a trifle high for the staple cotton we run, so if we don't run a half a number on the heavy side our work runs poorly throughout the mill, hence this little system is a valuable aid to us and has been the means of saving several thousand dollars to the mill each year since it was inaugurated—both in cotton and in labor.

A man specially trained in that work does all of our sizings and has time for nothing else.

Under the head of Spinning on our chart we have a space devoted to the average break of each day. We change our gears only on averages and then change all of each kind if we change any of that kind, so at all times each type of frame all have the same draft and twist gears, etc.

Now that my story is told, I'd like to ask—how much do other men's cards vary from standard as to percentages of waste and percentage of variation of the sliver weight?

Gen (Mass.)

Some Questions and a Comment.

EDITOR COTTON:

In several issues of COTTON there have been articles dealing with slashers, with splitting the sheet and taped warps. We are troubled with a twisting effect of the sheet, and taped warps would probably help this. Will someone give the information as to just how a taping board should be made? Please state whether it should be put in before the warps enter the size box or after, the material it should be made from, the depth of the grooves, how many grooves across the 54-inch spread, and any other information in this connection.

We tried splitting the sheet but had to abandon it on account of the ends sticking to the split-roll. We put this in as close as we could get it to the size box, thinking by keeping it hot the size would not stick to it and while it kept running it worked very well, but when we stopped to change a beam it hardened and then broke out bunches of ends. We moved it out about two feet with the same result. This is certainly a good thing and takes the strain from the yarn in front if it can be done. Will somebody volunteer the information?

Reading "Bab's" recent communication in COTTON on "What Makes a Successful Foreman?" suggests some experiences the writer has had. During the war I had charge of two States for the Quartermaster's Department, covering textile purchases. In one of the mills I had an inspector who had been three years in a well known textile school and had graduated with a sheepskin which stated he was qualified to be the whole works in a cotton mill. He was a young man of much natural ability, well poised and with plenty of courage, so much so that he had married, and this takes courage unless one has some means back of them. He was scheming as to how he was going to make both ends meet. Inspectors were not overpaid, and he asked me how, considering his textile education, would be the best way to break into the mill business.

I said, "Simpson, you've been around the mills now long

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enough to draw some conclusions. Frankly and honestly, do you think you can go into a mill and run any department without assistance? Do you think you could be a second hand in any department?" To this he very frankly stated that he knew he could not, that he would have to start in and just forget he had that three years in the textile school, but felt that it would enable him more quickly to make himself a factor in the mill, which I think it would do, providing he had other necessary qualifications. We hear quite frequently of rapid advancement by these young men, but almost without exception it is in cases where they have a father who is president, or else other kinfolks prominent in the management or ownership. They are put in as assistant superintendent or in some other position, at a more or less nominal salary, and have every advantage shown them in getting the necessary training and experience. If they are not natural born dumbells, they are bound to succeed and make very efficient men. Why shouldn't they? I even know some that never became very efficient, but they are doing very well on the salary list. This should not discourage "Bab," however, as there are more positions than there are favored sons, that many times a property becomes so thoroughly run down, that a real, honest-to-goodness mill man is needed, and that the greater percentage of them are run on the merit system. So, the thing to do is to be prepared, so that when opportunity comes knocking at the door, one will be equipped with the knowledge and experience to grasp it. Hoosier (Ind.)

An Opinion on Stretched Roving.

EDITOR COTTON:

This is my first entry in your discussion department, and in it I am going to ask some questions for somebody to answer, and give my opinions on some that have been published, covering two or three subjects.

I read a good deal in COTTON about stretched roving on fly frames, and this discussion has been good, but I think these writers have left out one mighty important point which I should like to bring up and have discussed.

From my way of thinking, and my experience, there is a large percentage of roving stretched after leaving the fly frame. Suppose we are running our fly frames with a high percentage of humidity, say 65 per cent, and take our finished roving to the spinning creels and let it be exposed to a 55 per cent humidity on the creel, it is surprising to note how much this roving will gain in diameter, and when the roving gains in diameter after it leaves the fly frames, we know we are getting stretched roving.

I have noticed for several years past that when roving is run with a high percentage of humidity and then takes a drop the spinner gets on the warpath and the spinning room goes to pieces. The spinning will continue to run bad until all of this "high humidity" roving is out of the creels. And the roving that comes from the fly frames after the drop in humidity seems to run good on the spinning, and this is what makes me believe that a large percentage of stretched roving is made after leaving the fly frame.

I think we could overcome a big portion of this by keeping our humidity down in wet weather to where we can come up to it in dry weather. If we get all of the humidity that we can in damp weather we are sure we are not getting enough humidity in dry weather to keep our roving from gaining in diameter.

Now replying to the question on balanced twist that "M. L. (S. C.)" asked in the March issue. What I would call balanced twist is just enough twist in the ply yarn so that when it is doubled it will turn neither way. "M. L." asks if he puts in 3.75 $\times$ the square root of the number of twist in his 26s yarn and then puts in 5.50 $\times$ the square root in the ply, will this balance it. I would say no. If "M. L." wants a balanced twist, and is using 3.75 multiple in his first twist, it would be better for him to use a 4.25 multiple in his ply yarn as this will come nearer to balancing it.

"W. S. B." asks "Where is the better place to do sizing—in the drawing or on the slubbers?" My way of sizing is on the drawing frame and the finishing speeder, and if I have to lighten-up or heavy-up I change the drawing frame draft gear. I size on my drawing frames because if I keep the drawing right it will run better on the slubbers. My experience teaches me that the picker room scales is the best place to keep numbers. If we will heavy-up on our laps in damp weather and lighten-up in dry weather we will have very little changing to do on the drawing.

Replying to "P. P.," who asks, does the roving twist come out at the spinning rolls, would say that it does not come out. "P. P." also asks what is the best twist to use on a fly frame under average conditions for an average yarn number of 17s. However, he did not give the staple of cotton he is using. If he is using ¾ to ⅞-inch staple, his proper twist multiple would be 1.30 $\times$ the square root of the number, and if he is using ⅞ to 1-inch staple, his twist multiple should be 1.25 $\times$ the square root of the number. If he runs 1⅛-inch cotton his multiple should be 1.20 $\times$ the square root of the number. I have tried these twist multiples and find them to be satisfactory.

C. S. (Ga.)

The Best Place to Do Sizing.

EDITOR COTTON:

In the March issue of COTTON, "W. S. B. (N. Y.)" would like to know which is the best place to do sizing, on the drawing frames or on the slubber. If "W. S. B." is a carder, he need not be told that a greater variation is found in the slubber strand. On the other hand, it is very seldom you find a variation of two grains on the drawing. One-half of the finished drawing deliveries should be sized every morning and the other half in the afternoon. Then the average found governs whether a change should be made and also the gear to put on to bring the weight of the sliver back to standard.

However, slubbers should be sized also, but not to determine a change, rather to find instead if the cotton gains or loses twist. Even when the finished drawing sliver is found at standard, a variation will be found in the slubber strand. If in case of fluffy cotton, the strand will be lighter, while in the case of wiry cotton the strand will be heavier. This is caused by the frictional contact of the front top leather rolls. That is why a short draft is best on slubbers. Again, as a rule, a small draft gear is found on the slubber and the change of one tooth here has often made conditions in a mill deplorable.

Wash (R. I.)

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Figuring Resultant Counts.

EDITOR COTTON:

In the May 1922 issue of COTTON "G. R. M." gave a very good example on how to figure resultant counts of ply yarns.

To those of your readers who have studied this subject, the following method, which I have used for years, may be of some value:

Taking the counts given, 15s and 20s, and making fractions of each, we have $\frac{1}{15} + \frac{1}{20} = \frac{4}{60} + \frac{3}{60} = \frac{7}{60}$, then dividing the denominator by the numerator, $\frac{60}{7} = 8\ 4/7$s resultant counts.

Another, 16s and 80s. $\frac{1}{16} + \frac{1}{80} = \frac{5}{80} + \frac{1}{80} = \frac{6}{80}$ which inverted is $\frac{80}{6} = 13\frac{1}{3}$ resultant counts.

In the latter example if the number of pounds of each is required to be known, simply subtract 13⅓ from 100, and the answer will be 13⅓ pounds of 80s and 86⅔ pounds of 16s. J. J. B. (Conn.)

Desires to Secure a Poplin Finish.

EDITOR COTTON:

I am enclosing a sample of poplin, and I would greatly appreciate it if you would get me advice through your "How Other Men Manage" Department, as to sizing formula to match this sample, also the methods and machinery to be employed to produce this finish.

Y. S. (Wis.)

EDITOR COTTON:

Replying to "Y. S.," would say that the goods are first carefully singed, wetted out in the mangle, batched up and mercerized. They are then passed into the kier, without previously souring and boiled with caustic soda lye of 1 degree Tw. They are then bleached in the usual way. After bleaching they are dyed and heavily mangled through cold water. The cloth is then dried and allowed to get quite cool. It is afterward conditioned carefully (this is an important process) on the damping frame (sprinkler) and allowed to lie at least two hours. The goods are then stretched on a clip stretching machine and afterwards calendered on a five-bowled compound lever calender, one constructed with wooden bowls only, using medium pressure. After this the cloth is ready for folding and packing. "Y. S." will note that *no sizing* is used in this, and this is the only proper method for finishing cotton goods into a poplin finish.

A cheap imitation of the foregoing can be made on unmercerized goods by mangling heavily after dyeing, drying, conditioning, etc., as above. Then glaze on a five-bowl calender (i. e., get a high finish). This calender must be constructed of brass and wooden bowls and goods must be chased on it, say about three times. The goods are then hot pressed between glazer cards in the hydraulic press.

If a silk "scroop" or crackle is required on any of these goods they may be treated as follows after dyeing and mangling:

The goods may be run on a padding machine at 86 degrees to 104 degrees F. in the following mixture. 1½ per cent starch; 1½ per cent coco butter; and ½ per cent tannic acid. This percentage is calculated on the weight of the goods.

The starch is mixed thoroughly with the water first, it is then boiled up with the coco butter and run through a sieve to the bath; the tannic acid is separately dissolved and then added.

The goods are now soaped in a bath containing seven per cent of olive oil soap and one per cent of starch, squeeze without washing and run in a cold bath (2 ends) containing 100 gallons (or a proportionate part of it) of water, 3 pounds tartaric acid, and 10 pounds of sodium acetate, squeeze and dry without rinsing.

I hope "Y. S." will be able to get what he wants out of this information, if not we shall be pleased to try again.

W. B. (Maine).

Reversing the Direction of the Card Flats.

EDITOR COTTON:

I have been reading and studying the letter from "R. E. C. (Conn.)" in the December number telling of his experiences in reversing the direction of his card flats, but I am at a loss to see the "point of progressiveness" that he intends to make out of it. The first thing I see is at the back of the cards where he takes out his strips, his good cotton is being taken in at this point, and it looks like that he will take out some of this on the strips. The licker-in is taking it up to the cylinder, and immediately the flats take out some of that which is just being delivered to the cylinder on the back.

On the front of the cards where the flats are supposed to begin their operations on the cylinder, the finished web is just over the doffer which takes it out. Then when the flats begin their working on the front, it's so near the sliver or web that is being taken out by the doffer, after it has been carded as the regular system goes, it looks like to me that the fresh flats going onto the cylinders clean, would pick up some of this cotton and the first sliver to get imbedded in the flats would be some that otherwise is ready for the doffer to take off. Now let's follow the flats as they go around the cylinder arches, and on to the last stands on the back of the card, where the flats are leaving the card and the stripping takes place. We all know that the licker-in takes the cotton up to the cylinders, then if a flat is leaving the cylinder preparatory to stripping, we know there is bound to be some good fresh cotton stuck on there to be the first to come off. Probably there is a lot to the idea that is of advantage, but I for one cannot see it.

Since writing the preceding remarks I have just completed a brief test on this reversing the card flats proposition, and will tell you what I found.

Now I don't blame "Contributor No. 76" who says that he is successfully running his flats reversed, for I don't know his conditions or his requirements. There are lots of things done to meet requirements which are detrimental to one thing or another in the manufacturing of cotton fabrics—

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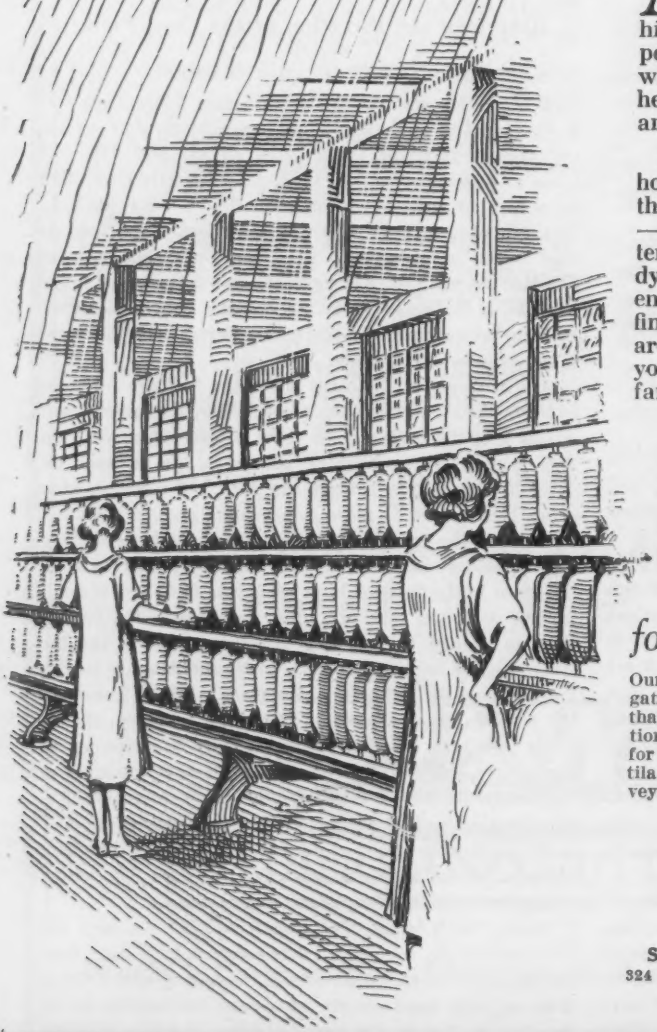

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done just to meet the requirements of the trade. I remember that I once ran a certain weave to suit the trade that cost us more than we got out of it, but we found our way into the market with this certain weave and got future orders that meant money to the mill later.

Thus we can't always tell when a thing is of benefit to the mill, but we can tell whether it is a benefit to the cotton or whether it affects the waste end of the mill. And here, I will say, reversing card flats is detrimental to the fibers, the longest ones. I found that, running backwards, the flats were taking out some of the long fiber that would otherwise have gone in finished sliver, that on going to the cylinder the flats were loading up with fiber next to the doffer; and on the back, where the flats were coming off the cylinder, they were taking out cotton that was never carded, and of course this had long staple in it.

I didn't run enough to test out the strength of the yarn, as I was more interested in the amount of waste that would result from this method of running the card flats. I didn't get a percentage on the waste so I cannot give this. However, it's bound to make more waste for the mill. My strips weighed heavier than usual and my flat speeds were just about the same as usual. I also tried out the evenness of the sliver, and could tell no difference, but I could tell there was a difference in the weight, by reason of taking out more cotton on the strips; it showed up lighter than the usual run. Contributor No. 14.

Do Spare Hands on Speeders Pay?

Editor Cotton:

I should like to see some discussion on this question. Do spare hands on speeders pay? If so, why? And if not so, why? B. E. (Texas).

Making Even Laps on Pickers.

Editor Cotton:

In April Cotton, page 473, there is a letter from "R. S. (Ala.)" offering a remedy for uneven picker laps. The next letter on the same page, from "T. A. D. (Ga.)," suggests another remedy. Both of these methods have been tried on hundreds of pickers, and as the matter of even picker laps is one that should be constantly and carefully studied, an analysis of these two remedies for an old complaint might not be out of place.

"R. S." suggests that the evener cones be wrapped with a piece of leather belt; this belt sandpapered and varnished to a good surface for the cone belt to run on. "T. A. D.," in the letter following, says that he has ball bearings on his aprons and uses a belt tightener. Both claims better results than with the old arrangement.

Since both men are trying to keep the evener cone belt from slipping, doesn't it seem that "T. A. D." has tackled the problem from the better angle? Lagging the cones is an old device. It offers a surface that the cone belts will stick to better than to a smooth iron cone. The cone belt therefore slips less. But its load is no less. With the ball bearings the load is less, and even without the belt tightener, much better results could be expected than if the load had not been reduced but the tractive effect of the belt increased.

Belting is not the only material used for lagging cones. Old card clothing with the wires removed has been used. One practice is to dip canvas or heavy cord in glue and wind the cones; sandpapering the surface afterward. Emery pulley paint has been used. I have even heard of a man who tried a wooden cone.

All of these attempts to settle the trouble have the same objection. While they increase the tractive effect of the belt, they are soft substances, and as the evener belt runs within very narrow limits about 98 per cent of the time, it is likely to wear down a groove in this lagging. The diameter of this groove is smaller than its place on the cone should be, so that the evening due to shifting the belt out of this groove is not what it should be.

Lagging cones—or for that matter, using belt tighteners—seems to be like treating blood poison with salve instead of something to purify the blood. Or hitching two mules to a wagon, when greasing the wheels is what it needs. In either case, the cause of the trouble should be aimed at if the effect is to be overcome.

Evencrs operate on the assumption that the cone belts will not slip at all. The feed roll speed is governed by the thickness of the lap, with no allowance made for variations in belt slippage caused by friction in the moving parts. And no matter what precautions are taken to keep the cone belts tight and running on good surfaces, the slip in this belt is going to vary with the variation of the friction drag on the cone. With ordinary bearings this friction changes with the weight of lap on the apron and with the frequency of oiling and cleaning the different roll bearings.

When a fresh lap is put on the apron, the friction is greater than before, and as the laps run out, the friction decreases. Just after the bearings have been oiled they run much freer than after a few hours in a dusty room.

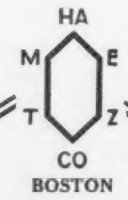
"T. A. D." has ball bearings on his aprons, and he only has to oil them once in three months, I should say, and never has any oil running through on the roll shafts and collecting chokes to jam the rollers. His frictional load is reduced to almost nothing, and what little is left is absolutely constant. He is no doubt getting better laps than he could without the ball bearings.

Another common practice that cannot be too strongly condemned is that of cutting out the belt shifting arm and putting a wide belt on the evener cones. The narrowest belt that will pull the apron should always be used. Even with a one-inch belt, the lower edge of the belt never touches the cone, and the use of a wider belt results in a sluggish and unreliable evener.

A wide belt is less responsive to shifting than a narrow one, and as a wide belt can be stretched tighter without breaking than can a narrow one, it soon stretches out on one side and gets lop-sided. Continued stretching gets the belt all out of shape and it will not run straight, but keeps weaving back and forth on the cone, constantly varying its speed.

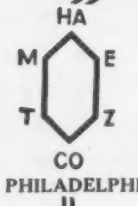
With the increasing tendency to do away with intermediate lappers, this question of proper evener operation gets more important all the time, and the opinions of those who have made experiments along this line of thought will be welcomed by the readers of this department of Cotton, I feel sure. A. (Mass.)

How many beats per inch are your beaters hitting the cotton?



BOSTON

Indanthrene
Helindon
Thio-Indigo
Hydron
Algol



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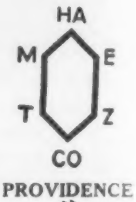

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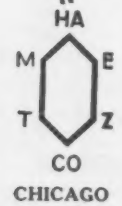

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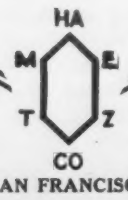


SAN FRANCISCO

Card Chains and Gear Speeds.

EDITOR COTTON:

I would like to ask through "How Other Men Mnaage," if it is a good policy to buy new chains when putting on newly clothed card flats, or is it best to take out one length of the old chains?

I recently heard two men arguing over the matter of two gears being the same size in diameter but two teeth different in the number. Which gear gives the greatest speed? This may sound silly, but all over the country you find gears of different diameters but with the same number of teeth.

I surely do enjoy reading "Old-Timer's" articles. Would there be any way to get him to come over to my mill? I would be willing to pay his expenses over here because I find that I can learn more by getting in touch with other mill men.

Please have the above two questions answered as promptly as possible. W. G. M. (Ala.)

(Editor's Note.—The next two articles by A. R. Dickinson of the Lancaster Mills, Clinton, Mass., and H. B. Taylor of the Cotton Department of the Pacific Mills, of Lawrence, Mass., respectively, were presented before a recent conference of managers of Lockwood, Greene & Co., Inc., and are reproduced from their magazine, "Builders" because they contain the type of matter usually discussed in this department and especially because they are worthy of a wider dissemination than they have so far received.)

Practical Experiments and the Results.

The best we can do in a thousand word paper is to hit the high spots—not with any view to bragging, but feeling that perhaps we might pass on some successful experiment which will help other members of our organization.

CARDING.

Enlarging the dust room did not entirely eliminate picker back draft. The deliveries from the large condenser fans were piped to the chimney, entering at a point a short distance above the chimney port to the dust room. This induced draft eliminated the back draft entirely.

Electric neutralizers were tried for a period of eight months on pickers, but were unsuccessful.

Split or raised card clothing, especially on cotton-cotton woolen and cotton foundation, has been a source of study. Some say the vacuum type of stripping machine causes such a condition. That the cement holding cloth plies on war time card clothing was defective, causing this trouble, is the opinion of others, as this trouble has occurred where no vacuum strippers have been used. Redrawing of clothing has been shown to change the position of the wire so that the effect of the knee is lost in grinding. The wheels grind on top of the tooth, causing a flat ground point instead of a sharp point, as desired. It is questionable if redrawing pays. New garnett wire of licker-in wire with tempered points and soft base are now being tried, which indicate favorable results thus far.

Reworkable waste:

Lap waste reduced 45 per cent in 1922 or 36,050 lbs.
Drawing waste reduced 15 per cent in 1922 or 12,800 lbs.
Roving waste reduced 57 per cent in 1922 or 17,000 lbs.

This was effected by overhauling and regulating pickers, installing a better system of weighing waste, and the public tabulation of waste per operative.

SPINNING.

Rubber rolls were tried in the spinning room. The usual rubber roll was to have the rubber vulcanized to the arbor. The new rolls tried were in the form of cots, having four keys formed in the cot which slipped into keyways on the metal arbor. They softened at the end because of oil and became useless.

Eclipse stop motions were tried in the spinning room. Eight spinning frames, run on one motor, were selected; four with Eclipse stop motions and four without. The ones with, were run through the noon hour unattended by the spinner. Production shows that on account of non-stopping and starting at the noon hour that the frames with the stop motions produce more proportionately in 53 hours than they did in 48. Lap waste on frames with Eclipse stop motions—2 pounds in a 53-hour week; on frames without—22 pounds in a 48-hour week. Eclipse equipment was improved the week ending February 17, and should show splendid results, especially on coarse work. Top rolls on machines with stop motions will last 100 per cent longer, and make cleaner and better yarn.

Variable speed motor on filling wind spinning, indicates that the yarn is stronger when the ring rail is in the center of the bobbin, and that higher speed can be realized at this point. An increase in production may be realized, but at present the percentage is not definite.

By reducing the diameter and increasing the length of bobbin in the spinning department, the yards per bobbin were increased, and doffing and waste were reduced at a great saving per year. Saving on doffing alone was $1,700 per year.

SPOOLING.

This change in the dimensions of the bobbin, reduced the cost of spooling .00351 per pound. Naturally, by putting more yarn on one bobbin, the spooler's work was reduced; that is, she had 114 less knots to tie and 228 bobbins less to handle in each truck. By reducing knots, liability of kinks, knot slippage, etc., was decreased and quality of work improved.

A number of different tension devices have been tried on spoolers to spool filling wind, but none have excelled the performance of the Whitin Spring Disc Tension on 26s and 31s.

FILLING.

By installing new bunch builders on the filling frames in the spinning room and long chain quilling, and by the concentrated effort of overseers and operatives in various departments, the butt waste stripped from Draper looms was reduced 25 per cent and from Crompton magazine looms, 31 per cent.

Cost of installing new bunch builders	$ 8,640.06
Gross saving for first year	10,182.30
Net saving over cost of investment	1,542.36

By reclaiming waste yarn on tubes and selling it to the rug trade, the value has been increased.

Previously sold at .065 per lb. as clean yarn waste	$ 679.57
After tubing, sold at 24c per pound	2,509.20
Total net saving per year	1,829.63

A partial list of textile chemicals for which we are headquarters.

Oxalic Acid 99%
Albone (25 volume Hydrogen Peroxide)
Alumina Sulphate, 17/18% Iron Free Powd. Lump
Antimony Salts 65%
Bleaching Powder (Chloride of Lime)
Epsom Salts (Magnesium Sulphate)
Blue Stone (Copper Sulphate)
Glauber's Salt
Formic Acid 90%
Formaldehyde, U. S. P.
Bichromate of Potash
Carbonate of Potash (all grades)
Caustic Potash 88/92%
Permanganate of Potash
Chlorate of Potash
Yellow Prussiate Potash
Caustic Soda
Sodium Acetate
Bichromate of Soda
Bisulphite of Soda (white powder)
Solozone
Sodium Sulphide (60/62% Broken Pieces and Fused)
Sodium Sulphide Crystal 30/32%
Tri Sodium Phosphate
Sal Ammoniac 99%
Zinc Dust
Y. P. Soda
Chlorate of Soda
Nitrite of Soda
Chrome Alum
Barium Chloride

R&H CHEMICALS

41st Year

Antimony Salts
65%

Acetate of Soda
Fine Crystals

Sulphide of Soda
Crystal and Conc.

The R&H record of growth to its present prestige is proof, first of the need for sincerely high-grade chemicals; and, second, of the intelligent appreciation that marks the character of R&H customers.

The ROESSLER & HASSLACHER CHEMICAL CO.
709 Sixth Ave., New York

WEAVING.

In installing 420 new looms, it was necessary to move about 1,000 looms to keep the looms of the same type in their sections. Notwithstanding that these looms were moved and had to settle down in new positions, the percentage of efficiency was increased one-half of one percent for the year.

Much meritorious labor has been performed by the weave room and mechanical organization in making these changes, but the only change in the fundamentals was to adapt 28-inch looms for weaving 32-inch goods without making any change in the over-all width of the loom. A spring attachment was invented for holding the bobbins in the magazines in proper position, which has been purchased from the inventor in the Lancaster Mills weave room and was adopted by Crompton & Knowles Loom Works.

FINISHING.

A chemical analysis was procured in regard to softener, with the result that equipment for making softener was installed by the mechanical department at a cost of $550.00. Previously our records showed the following:

240,000 pounds per year at 5 cents per pound...$12,000.00

With the new equipment:

240,000 pounds per year at .0164 per pound.... 3,936.00

Total saving .....$ 8,064.00

TENTERS.

The belt drive from dry room to counter shaft has been replaced by a chain drive, thereby eliminating loss of production while repairing burned out belts, and also saving leather. A gain of 5 per cent in production was thus brought about.

MECHANICAL.

The cost of the lubricating of looms was investigated in the following way. Several types of lubricant of similar consistency and quality were analyzed. Grease that had been in use for a number of years was costing 18 cents per pound delivered, and the grease which the analysis showed to be its equal, and slightly higher in mineral contents, cost 12 cents per pound delivered.

By changing these lubricants, a net saving of $3,060.00 per year has been brought about.

Tests are now being made with another grade of grease, and if successful, will make a further saving of 25 per cent, or approximately $1,500.00 yearly.

A. R. Dickinson.

Economies in Picking and Waste Handling.

Since the last conference, the picking in our main mill has been reorganized in such a way that we can do the work better and easier with less help than we have ever been able to do.

Our old organization consisted of four Kitson feeders which were considered bale breakers when they were purchased, twelve feeders attached to the openers with a three-bladed beater and dust trunks on the first floor and twelve, one-beater breaker intermediates and finisher pickers on the second floor. It required four men on the first floor and seven men on the second floor to run this organization which had been in use from fifteen to twenty years and some of which was in poor condition.

We now have four Saco-Lowell, No. 4 bale breakers attached to the vertical openers on the first floor and twelve No. 5 automatic feeders attached to the breaker pickers which have one three and one two-bladed beaters and fourteen finishers with Kirschner beaters on the second floor. These machines all have beater locks and belt guards and Saco-Lowell adjustable grids. All finisher laps are weighed and rejected if there is more than one pound variation in them. We. also, have a Thomas automatic control on six of the feeders which is doing very good work and we have ordered the Corn swinging idler cone frame for all of our finishers after a three-month's trial of them. We are able to run the room on the first floor with two men and the one on the second floor with four men and the work is much more satisfactory and we, also, have more room on the first floor for storing and opening our cotton. We are able to keep our rooms much cleaner than with the old style system.

In the fall of 1920, we found ourselves like other mills unable to sell our picker waste as we had in past years and at first, we were required to take the dust room fly out of the picker and then the vertical opener waste and sweepings and then the trunk waste and finally in 1921, it was not possible to sell even the waste from under the beaters. We then began to investigate the advisability of cleaning our picker waste and found that the Cotton Research Company had a Saco-Lowell willow which we were able to obtain and we started on January 1, 1922 to clean all of our picker waste, licker-in and card fly. In the past six months we have made a profit of some $1,100 by cleaning our waste and we expect about the same results for the present six months, although, there is not as much profit in cleaning waste on the 1923 prices as there was on the 1922 prices. It takes one man about all of the time to clean the waste made in our three plants, averaging about 8,500 pounds per week and it costs about ¼ of a cent per pound of the waste fed for cleaning. We get about 37 per cent clean waste from our picker and dust room waste and about 46 per cent clean waste from licker-in and card fly. Where the waste is cleaned we only have about ⅔ as many bales to put up as we would if the waste was not cleaned. It costs about fifty cents per bale to bale the waste. While it is a very dirty job to clean the waste, yet on the whole, we are pleased with the results we are getting and think that when there is no demand for waste, that our chances of disposing of the clean waste would be better than it would be with uncleaned waste.

H. B. Taylor.

Answers "P. P.'s" Spinning Questions.

EDITOR COTTON:

"P. P. (Ga.)," in the March issue of COTTON, puts the following questions: On a spinning frame does the twist come out of the roving in drafting between the rolls? If so, where does it go?

If "P. P." will study what takes place between the drawing rolls, he will arrive at the following conclusion: that the fiber itself is not twisted, but instead, is twisted with other fibers. Now for the sake of illustration, let us assume that a spinning frame has a draft of eight inches, which is a very short draft. To make my point clear, let us

Increased Production

The treasurer of a representative Southern mill says: "Some time ago we attached Root Pick counters to our looms, which we believe has a remarkable effect upon our weavers. They now run the looms during the noon hour, and sometimes turn them up before starting time, and keep them running after quitting time. This is the principal cause of our increased production."

Better Production

The weaver knows that an occasional kick will not give him a cent's worth more in tonnage. In this way a more uniform and standard piece of cloth is made, so there is no incentive to kick the pick which causes thin places. This permits you to positively guarantee the uniform quality of your cloth, and that alone is worth the price of the counter.

Exclusive Advantage

The advantages over "cut mark" or "yardage" method of paying with its uncertainty of guessing and estimating is entirely eliminated when you pay by the pick. The counter has recorded all picks woven and the weaver can be paid any time without loss to himself or to the company. It settles disputes which arise over pay as the weaver can check his week's wages at any time.

Promote Harmony and Satisfaction

Payment by the pick rewards the workman for the actual amount woven—weavers leaving you can be paid off immediately—accurately—no argument between the crews of day and night shifts is possible.

In each of the above there is a decided extra benefit in permanent harmony and satisfaction among your weavers—it is showing them square treatment.

Incentive to the Weaver

By being able to check his week's wages and knowing what it is at any time, the weaver becomes more interested in his work knowing that he is being paid more for increasing his individual production. And again, no weaver wants to be classed as the poorest workman so he will exert himself to the utmost in order not to be shown up by his fellow weaver—for payment by pick the Root counter way places them all on a strictly competitive basis.

The Census Takers of the Textile Industry

ROOT COUNTERS —in the Textile Mill

A NECESSITY TO QUALITY PRODUCTION

ELIMINATES ALL CHANCE OF KICK

Efficiency and Economy in the Textile Industry, as in every industry, depends upon modern Equipment. But why limit that equipment? No present day business would consider doing away with the adding machine. Remember the adding machine starts where the Root Automatic Pick and Hank Counters stop—why not use accuracy from the beginning? To count correctly raw materials and Individual loom Production and Individual output of each weaver, is the only method by which production costs can be attained from start to finish.

Our Engineers have successfully overcome the obstacle of vibration which heretofore has caused so many otherwise good counters to fail. Direct connection to the moving part of the loom had short life, likewise the flexible shaft, so after much research work they hit upon a plan of attaching a counter to the loom frame and drawing it by worm and gear from a cam shaft through two universal joints and a connecting rod, which has proven to be the most dependable possible way. See illustration below.

ROOT BRISTOL, CONN.

KEEPS THE WEAVER AT HIS BEST

THE EYES OF PRODUCTION

AN INFALLIBLE RECORD KEEPER THAT DRAWS NO PAY

again assume that there are only eight fibers in the cross-section of the strand, and that we have 3.5 turns to the inch in the strand fed. In such a case the first fiber acted on by the forward rolls will be eight inches from the fiber last acted on. Therefore, the first fiber first acted on and having 3.5 turns around is pulled and caused to slide over the surface of the other fibers. This is just to give the idea. But what really takes place is that the fibers are drawn past one another and a certain amount is lost or taken out of the strand at the second rolls, and by the greater draft between the second and front rolls, the twist is taken out completely. That is why we are obliged to have the greatest twist on the forward rolls.

As regards the best twist to use on fly frames, the answer is to have enough so that there will be no breaking back at the next process. I make the following test: I place five full bobbins on the floor and reel off a little over one-half a layer; if no ends break, I know I have enough twist, but if any ends break before one-half layer is reeled, I insert a tooth of twist immediately.

I take little stock in the percentage of regain and humidity. Wash (R. I.)

Comment on Overcoming Loose Threads.

EDITOR COTTON:

I desire to draw attention to "T. A. D.'s" letter, "Overcoming Loose Threads," in the March issue. It refers to my experience described in the September issue as having been similar to his troubles. To begin with, I think "T. A. D." didn't understand the trouble L. R. Gilbert, of Raleigh, was having, as described in the report of the Wrightsville Beach meeting in the July number of COTTON. Mr. Gilbert is the one who first mentioned flat threads, or two threads in as one purposely, as the design calls for. This is only a matter of knowing how to beam correctly or put the yarns on loom beams so that the take up will be the same to the plain and double end draft, as I explained in the September issue.

I can see no relation whatever between Mr. Gilbert's difficulty and the troubles that "T. A. D." was having—and is likely to have if he imagines that covering a certain roll on the warper will remedy spooling that is poor, or take care of tight and slack ends running from a badly set-up creel. I consider the covering of the roll on the warper and putting a rod through the sheet at the slasher as the yarn leaves the size box very poor make-shifts. Poor warping will make very bad weaving, and is the cause of yarn breaking in the slashing, threads going in from one sheet to another making dressed doubles, so, in poor sets, the thing to do is to put new strings in between the sections at the beginning of each new loom beam.

"T. A. D." mentions cones set to run at a correct speed at the last part of the beam. If the machine builders would put cones on all makes of warpers it would be a great help, with good spooling, warper creels set at the proper angles, and pegs of the proper length and enough space for the spools to run freely from the sides of the creel. All pegs should be of one diameter. Pegs do not cost much and should be renewed all at one time, instead of throwing out a few at a time and putting in a few new ones. This will cause uneven tension on the beams which no cloth covered roll can rectify.

Such beams as "T. A. D." has been making from his warper—which I believe are just grey yarns—should have been detected in the making by one of keen knowledge just looking at the warper in operation and stopping it.

What I desire to make plain and clear is that in all my positions as an overseer I have had the warping and beaming and slashing, and in this way could get good beams to put in the slasher; and no other kind will make good loom beams. One doesn't find many mills, especially on colored goods, where a slasher will operate all the week and have only five or six ends to put up in that time. But it has been done and can be done again..

I think most of the readers interested in these lines will easily see the great difference between "T. A. D.'s" poor warping and the experience of Mr. Gilbert together with the suggestions made thereon by the writer in the September issue. I just didn't want this misunderstanding to go by without calling attention to it. Mack (Ga.)

Balanced Twist.

EDITOR COTTON:

In the March issue is a question on "What is balanced twist?" asked by "M. L." If "M. L." puts 3.75 $\times$ the square root of the number of twist in his 36s yarn, single, it would give him 22.50 turns per inch, and he wants to balance it by putting 5.50 $\times$ the square root in the ply. By doing this, 36s/2 is equal to an 18s single. The square root of 18s $\times$ 5.50 would give 23 or a little more turns per inch which would balance the twist per inch practically to a neutral. For a dry twist the yarn may kink, according to the twist gearing and the twist constant used, but in a case like this I prefer a wet twist with a solution of gum arabic, which will, as I have figured, give good results.

I would like to hear what some other readers think of this question of balanced twist.

C. M. (Conn.)

(Another contributor mentions briefly this question of balanced twist in his letter entitled "An Opinion on Stretched Roving."—EDITOR.)

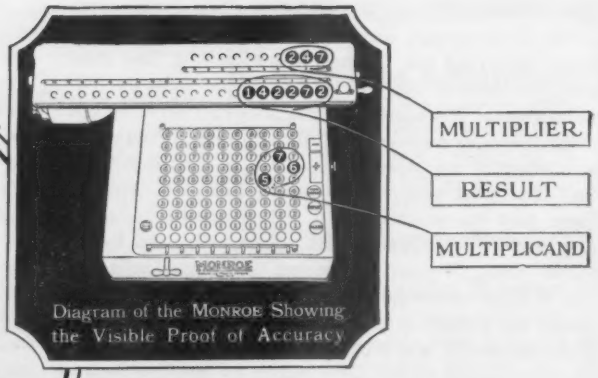
Reducing Labor Costs.

EDITOR COTTON:

Practically all mill men know that the labor cost is less in manufacturing yarn from single roving than from double roving at the spinning, but there probably are a good many who do not realize that the labor cost is also cheaper to make yarns, above 50s, from four processes of roving than from three processes.

To some it may not seem practical or possible that four processes can be cheaper than three, but it will be seen from the following example that this is true:

We will take as an example 70s combed yarn made from three and four processes of roving and it will be shown that four processes is 31.26 per cent cheaper than three processes. First, we will take up the four-process method, starting with a 12-ounce lap at the back of the card, allowing five per cent waste at the card, fifteen per cent waste at the comber, doubling six on one process of drawing, 20 on the sliver lap, six on the comber and six each on two processes of drawing; (ribbon lap is not used in this case) two each on intermediate roving, jack and spinning. Using



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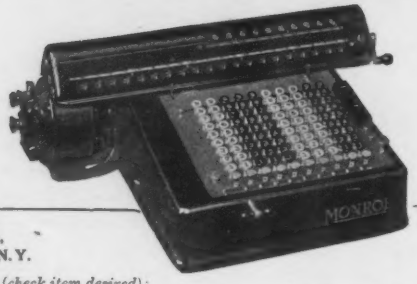

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a draft of 100 at the card we will get a 50-grain sliver, and using a draft of 6 at the drawing we still have a 50-grain sliver. Using a draft of 1.66 at the sliver lap, a 602-grain lap is obtained and a 56 grain sliver is obtained from the comber by using a draft of 55. We obtain the same weights at the two processes of drawing by using a draft of 6 on each. A draft of 3.5 on the slubber will give .53 hank which will give 1.325 hank at the intermediate with 5 for a draft. A draft of 6 on the roving frame will give 3.975 hank and using a draft of 7 at the jack we get 13.91 hank, which will give 70s yarn at the spinning by using a draft of 10. The production per hour and cost per pound of the various machines is as follows: Picker, 2.26 pounds at .002022 per pound; card, 7.72 pounds at .005508 per pound; Comber, 13.7 pounds at .009051 per pound (cost includes first drawing and sliver lap); drawing, 16.07 pounds at .002455 per pound; slubber, 2.6 pounds at .001538 per pound; intermediate, 1.16 pounds at .002522 per pound; roving, .2675 pound at .005065 per pound; jack, .0434 pound at .024460 per pound; spinning, .0081 pound at .050370 per pound. (The production of the roving and spinning frames is per spindle and the picker cost is the same for three and four processes). The total cost, then, using four processes of roving, is $0.10293 per pound.

In the three-process method with the same doublings, allowances for waste, etc., we will use the same drafts and weights up to the comber. With a draft of 60 at the comber we will get a 51.17 grain sliver. At the first drawing after the comber we will get a 47.23 grain sliver by using a draft of 6.5; using the same draft at the second drawing we get a 43.59 grain sliver. On the slubber we get .955 hank with a draft of 5, and on the intermediates, 3.307 hank with a draft of 6.93. Using 8 for a draft at the jack we get 13.288 hank, which will give 70s at the spinning with a draft of 10. The production per hour and cost per pound, using three processes of roving of the various machines, is as follows: Card, 7.72 pounds at .005508 per pound; comber, 13.65 pounds at .009084 per pound (cost includes first drawing and sliver lap); drawing, 12.6 pounds at .003116 per pound; slubber, 1.015 pounds at .003840 per pound; intermediate, .296 pound at .009885 per pound; jack, .0472 pound at .022428 per pound; spinning, .0081 pound at .050370 per pound. (The production of the roving and spinning frames is per spindle). The total cost, using three processes of roving, would be $0.106253 per pound, while the total cost using four processes is $0.102931. From this we see that four processes is 31.26 per cent cheaper than three processes.

This example takes into consideration labor costs only, but it can readily be seen that the cost of the machines, floor space, etc., would also be less, as the production of the slubber and intermediate is much less when using three processes than when using four processes. This would mean more slubbers and intermediates for the three processes and as the cost per spindle of these frames is greater than roving frames and as they occupy more floor space, the cost for these items in the three-process method would also be greater.

While it is true that usually it requires four processes of roving to make 50s and above anyway, this is only an interesting example to show that the apportioning of drafts in the various machines affects the cost. Still, there are many manufacturers who are making 50s from three processes when it could be made cheaper with four processes and at the same time make better yarn. Many others are losing money because of the incorrect apportioning of drafts and weights in other instances. N. B. M. (Mass.)

Good Cotton and Better Goods.

EDITOR COTTON:

The subject taken up by the Southern Textile Association, the relation of spinning to better goods, as reported in the November number of COTTON, is a very good one. But there is one factor which is very important if we are to have better spinning, and that is the proper grade and quality of cotton to spin the numbers desired.

We have today some very good textile machinery with which to manufacture cotton goods; and we also have some first class men in charge, men who understand just how to set each machine from the picker to the cloth-room. If we are to spin good, strong, clean yarn we must also have good clean cotton, and good, long, strong staple, equal to the numbers. We must take into consideration that a card cannot be set close enough to take out all the dirt and seed and neps there is; a card can only be set as close as it will run without damaging the clothing, and if we have good, clean cotton to begin with, after it has been through the pickers it will be a great help to the cards. Many times I have seen good, clean cotton, and good, long staple, and yet the quality was so poor that there was no strength to the staple. Strength should be looked at as well as cleanliness.

We have in New England some very good cotton mills, and they are producing some very nice goods, and they have no trouble in regard to breaking strength of the yarn, or with dirty-looking goods. For the simple reason they are using the very best of cotton. Their textile machinery is no better than some other mills', and their operating executives are not a bit more practical. The whole trouble is that many of our mills are trying to make better goods and fine goods with a poor class of cotton. We cannot expect a good ending with a poor beginning. It does not matter how good or how practical a man is, he cannot do something with nothing. I may be a first-class carder, but if the management demands first-class carding, then I must demand first-class stock. And unless I have it, I cannot fulfill their demands. Of course we understand that a good grade of cotton, with extra long staple, costs more per pound. But I fail to see where anything is saved by using poor and cheap cotton. Cheap cotton requires more twist, and reduces the production, produces more waste, damages the machines, and makes the work run bad all through the mill.

I do not mean to say that all the mills are using poor cotton. Many mills are complaining that they can't get their yarn to break at standard, and the operating executives are trying their best to do something to bring the breaking strength up to standard, but if the carder knows that the cotton does not equal the numbers, he knows that he can do nothing more than the best he can with the stock he is using. All the time the selling end is looking for better goods. How much better a cut of cloth looks made from good, strong, clean cotton! Many times I have seen the superintendent call the carder out to the

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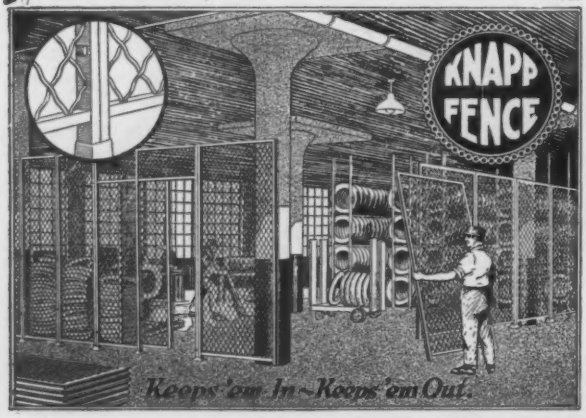

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Southern Wood Preserving Co., ATLANTA, GA.

cloth-room and show him some poor looking cloth, and ask him if something couldn't be done to improve it. Of course, something must be wrong with the pickers or cards, because they didn't remove all the dirt and neps and seed. But he doesn't say anything about making a change of cotton, oh, no! He also can't see where he can have the cards repaired because it costs too much, whereas if a good grade of cotton was used the cards would be in a better condition, and that extra expense would be avoided.

What will damage the cards any more than a poor grade of cotton? Absolutely nothing, and why will poor cotton damage the cards? Because in order that the cards will turn out a good clean web, they are set just as close as the grinder can set them, and oftentimes are too close. It is a very poor policy to overdo the cards, because the result will be loose cylinder clothing, faced tops, dull licker-ins, and damage to all parts of the cards, and then comes the expense of repairing the cards, which is a big item. Show me where anything is gained in such cases! If a few cents a pound is saved on cotton, before it reaches the finishing department, that few cents will be lost, and more, too. Because poor cotton requires more twist, and more twist is a loss in production, more waste will be made, and last you will have a set of dissatisfied help. Because the work runs badly.

A good mechanic may have good tools, and the proper tools to do a good job, but if he doesn't have good stock he can't produce a good job. He will do the job but what will it be when it's done?

Many mills today are trying to manufacture better goods, but are having little success. My advice to them is to make a change in the cotton, and I will be pleased to hear their results. They will notice that their troubles will be over as far as a better spun product is concerned. Get better cotton and leave the results to the operating force. And I know that they will take good care of their part of it, and it will be a heavy burden off their shoulders to have good stock to work with. They will surely know just how much twist, draft, and other things to put in; and I am sure that big results will be noticed when the goods are finished.

Speaking of draft, I will say that under no consideration should a man draft too much. It does not matter whether he is on carding or spinning—overdrafting is sure death to any stock used. Draft as short as possible, and I think that most of the reader of COTTON will agree with me—especially those who have been up against this same problem of excessive speed and poor cotton. These are two of the major troubles in many mills today. But of the two, give me good cotton, and I will take care of the speed. But understand, I am not in favor of excessive speed. Show me a mill with plenty of speed and poor cotton, and I will show you a mill that will never reach the era of better goods. Of course, it does make a difference as to the kind of goods; if on coarse numbers, then a mill can get by with cheaper cotton, depending upon the grade and kind of goods. Go into a mill where good cotton is run and see for yourself what nice, clean rooms there are, everything shining, and then go into a mill using cheap cotton, and you will hardly be able to see the machinery, and I must say that we have some very dirty mills. And yet I dare say that those mills are the ones having trouble getting better goods. And they are trying everything but the right thing to produce goods on an equal with those produced in the good clean mills.

Some of the readers may not agree with me in my statements, but this is my honest opinion as to how we can get better goods. I will be pleased to read the opinions of others on this subject. We do not all see and think alike, but as the old fellows say, if we don't speak there would be no arguments. We must all live and learn. I am not asking anyone to do as I say unless my reasoning sounds logical to them, but I am saying just what I think, and what I really believe. I hope others will give their opinions. We have all had our experiences, and I am always ready to listen to what the other fellow has to say—and the place to say it is in COTTON.

My statements may not refer to the southern mills, that I do not know, but I will say that this is the cause of many of the northern mills not making better goods.

Experience (Conn.)

On Taking Care of Machinery.

EDITOR COTTON:

In a recent issue of COTTON H. D. Martin said "Take Care of the Machinery—It Pays." I should like to say that Mr. Martin is dead right on this question; it not only pays in the machinery alone, but also in the making of a yarn that will come up to standard, and I should like also to state a few facts in this connection, as this is no little matter. There are as many things that will cause machinery to go down as there were colors in Joseph's coat.

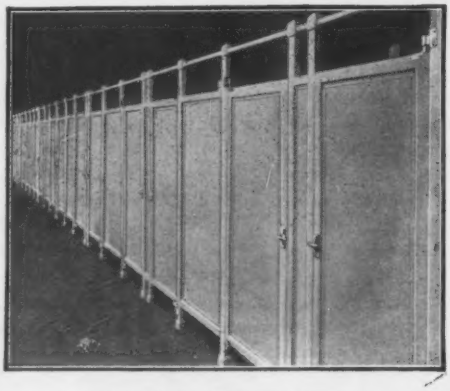
Taking up first the picking machinery, one picker should be taken down every Saturday and given a good cleaning; the calender rolls and the screens should be taken out and the rolls given a good scrubbing with emery cloth and kerosene. All gears should be cleaned and any worn ones replaced with new ones. A thorough cleaning must be made around the ends of the screens, and if these are bursted or have holes in them, the holes should be laced up with a small wire and hammered down flat. If the wire is loose at the ends or where it is put together in the center, it should be soldered back before putting it back into the machine.

The man doing this work should examine the knock-off motion to see that all the gears are good—here, as the saying goes, a stitch in time saves nine. I for one do not believe in running a machine with the gears half worn out, as I have seen in many cases, for the mill is sure to pay three-fold for it.

Then, watch the evener motions, for the best that can be gotten out of them will not be too good by any means. A good evener belt should be kept, one that is cemented together, never run a buckled belt here.

When the picker is torn down for cleaning tear down the evener also and go over it. Watch after the beaters and keep the blades sharp where they are used, and the spikes in good condition where spiked beaters are used, for it is not the draft that counts so much in good picking but the blows to the inch. Now I don't mean by this to beat the cotton to death, for there is a limit to all things. All aprons should be kept working freely.

Taking up the subject of the care of machinery in general, when the overseer enters his room each day he should try to look upon all the machinery there, representing



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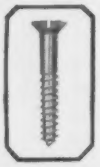

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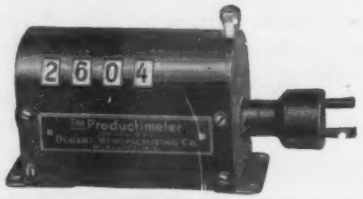

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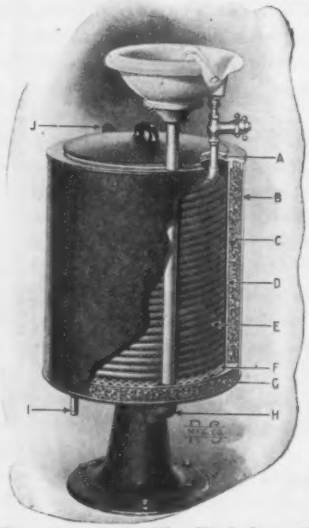
1000 HOURS



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thousands of dollars, with a feeling of responsibility. He should make sure that the machinery intrusted him is handled carefully, and should realize that the life of the machinery is the life of the plant. Some men advise keeping the machinery up to its highest productive capacity, pointing out that the maximum production of the machinery reduces the cost. This is one of the greatest mistakes to be made. Why do we get a stronger yarn from a stationary top card? It is not because it is a better card, it is the difference in the speed. Why does the American cone differ from the English cone? This difference is in the speed. High speed on the fly frames will cause more friction of the cone belt, owing to the vibration of the cones. Why are most all drawing frame steel rolls shamefully abused by the unskilled help? When a drawing front roll is made to revolve at a speed greater than 400 revolutions per minute, it only takes the fractional part of a minute from the time a trumpet chokes and the frame fails to stop for the cotton to become lapped around the steel roll. Roller laps on high speed drawing frames are very hard to remove because the high rate of speed causes the frame to run for a longer period of time after the lap is formed than it would with a lower speed. Consequently the roller lap is much harder and of course more difficult to remove. Sometimes the steel roll is bent and the gears broken.

The manner in which the drawing frames in some mills are cared for would make very tough reading for the stockholders. In some mills where the help is not cautioned against using knives, steel hooks and even hammers and screm drivers, the first thing done when a lap is formed is to cut it off with a knife. In many cases the flutes are cut for an inch or two to such an extent that their drawing quality is destroyed. Again, after the lap is cut it is sometimes difficult to remove it from between the rolls. In such cases I have seen drawing tenders and even second hands and overseers use a screw driver and hammer, and the lap wedged between the rolls was driven off the boss to the space between the roller stands and the boss of the rolls.

The only proper way to remove a large roller lap that is tightly wedged between the rolls is to remove one of the steel rolls. When an ordinary lap is found on the steel rolls the lap can be removed almost as fast with the two thumbs as it can be cut off with a knife, especially if the roller lap is on the front roll where the fingers of both hands can rest on the clearer cover and the two thumbs given an oscillating movement, which will quickly loosen the lap to such an extent that it can be moved very easily. This method should be tried. It's a shame that we can enter cotton mills that have been running for only a few years, and find the machines showing marks of unnatural wear due to lax methods for which the overseer alone is to blame. Machinery will deteriorate fast enough with proper care; therefore if neglected its efficiency is more quickly reduced.

The overseer should not place too much confidence in his second hand, as sometimes good help are forced to quit their jobs for no other reason than the second hand imposing upon them by not keeping their machines in good order, such as changing rack gears, and some of the many other gears found on fly frames. A carder, after getting his help placed, should begin to make his rounds, first going to the picker room and seeing that the hopper is being fed as it should be, not too full nor allowed to run too low, but kept two-thirds full, or as near that mark as possible. Then he should examine the beaters to see that they are not making too much noise.

I believe Mr. Martin named most of the worst cases of improper care of machinery in his article, but I would like to give a few don'ts in this letter.

Don't allow the licker-in to be sharpened with a brick or file. Don't allow any broken parts to remain on the cards. Don't allow any broken gears to remain on the cards. Don't allow any gears that are broken or slipping or skipping to remain on any machine. Don't allow broken roving skewers or broken creel steps to remain in the speeders or spinning frames. Don't allow any rollers to remain in the speeders or spinning frames that have become fluted by the steel rolls, or that have loose leather on the bosses. Don't allow the roving guides to become and remain out of working order, or the roving trumpets to become clogged up. Watch both the steel and leather rolls throughout the room and keep them in good condition. Keep the flyers on speeders balanced and in line. Keep bolsters cleaned and in line. Keep frames in general leveled and lined. Don't allow them to run otherwise because nothing will cause wear and tear of a frame any quicker than to allow it to get out of line and level. Keep both top and bottom clearers in good condition. Don't allow worn-out ones to remain on. Don't allow waste to remain on the steel rolls. Don't allow tail ends to run off the laps into the cards. Don't allow the oil to get out of the comb boxes on the cards. Don't allow the grease or tallow to get out of the cylinder bearings on the cards.

In conclusion I should like to say just a word to the overseer about his job. Be on the job early, don't be afraid to get there ahead of time, and never be late. Put all your time into your job, and give your employers the best that is in you. Don't watch the clock. Try to get off more work than is expected of you, both in quantity and quality. The man who has these qualities is soon found to be too big for the position he holds, and promotion is the next thing in order for him. Every man must try to be larger than his position, but he must be mighty careful not to feel above his position, because he is then on dangerous ground. Make your position the whole course of your study and cling to it as though the whole world would grasp it from you if it could.

Bab (N. C.)

The New Brunswick Chemical Co., of Newark, N. J., is manufacturing a line of special finishes and sizing assistants of particular interest to textile mills. These are the result of a close study not only of the needs of the market but of those commodities which are already available and as a result of the research so conducted the line of products made by The New Brunswick Chemical Co. is believed to be of especial value to those interested in securing high class finishes.

In order to bring these commodities to the attention of the textile mills the company has decided to inaugurate an extensive publicity effort which is now being released by the Hazard Advertising Corporation to the trade papers.

The successive advertisements of The New Brunswick Chemical Co. will therefore, it is believed, be of particular interest to the practical mill men who is desirous of keeping well abreast of new developments in this line.

Machines Take Place of Many Operators

Substantially Lower Cost of Cleaning Roving Bobbins

Mill executives find the Termaco with one operator will clean 36,000 roving bobbins each working day.

It is a simple matter to operate the Termaco, as all gears are guarded to prevent even the possibility of an accident or tearing clothing. Simply feed to Termaco any bobbins not over 12 inches in overall length and the machine quickly cleans off all waste.

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Cut gears, ball bearings on all high speed shafting, heat treated steel parts used wherever necessary to long life, highest grade material and workmanship throughout, and perfect interchangeability of all parts—these are the reasons Termaco machines give satisfactory, continuous service at a minimum upkeep cost year after year.

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A Belt Tightening Device for Pickers.

Editor Cotton:

On all Kitson pickers the cone belt must be given vigilant attention continually in order to make the evener motion sensitive. To get even yardage the cone belt must not be too tight or too slack. That picker cone belts are neglected in many mills cannot be denied.

There is a new device on the market to keep the tension uniform. You just put on an endless belt and it never needs any more adjustments. I had this device attached to all my finisher pickers and it does all it is claimed to do. That it is not advertised is strange indeed.

The device is simple. You just have two holes drilled in the casing under the back cone, which is the fulcrum point. The adjustable or bottom cone is severed from the casing and its journals are attached to the device. Two small weights are hung on each side of the frame and keep the cone belt tension uniform.

I am satisfied of this, first, that it will save cone belting in every mill where the cone belts have been neglected; second, it will save labor; and third, it will make a man more certain of even yardage.

They say it is a southern idea. Wash (R. I.)

Lining and Leveling Spinning Frames.

Editor Cotton:

Often it occurs that an overseer of spinning or a second hand, or some other official, particularly in a small mill, is called upon to level and line spinning machinery. Some new spinning frames may be installed to piece out the equipment. The mill may be small, and as there may be no regular master mechanic, it would be very expensive to send for an expert from a distance to perform this service. Therefore it is very convenient for a man to know how to line and level his own machinery. It increases the efficiency of the man and sets him up better in the eyes of the management.

Twice in the experience of the writer it has occurred that the work of leveling and lining his machinery was not being properly done. The first time this was discovered was when the mill carpenter was given the work of lining and leveling a room full of spinning frames. The carpenter said he could do this work, and there was no apparent reason for doubting his word. But after he had "done" a couple of frames it was discovered that he could line a frame but that he could not level one. A frame may be level and yet not be lined, or it can be lined and still not be level. This was the trouble with this carpenter's work. He had lined the work but had not leveled the frame. The frames were well lined, and as straight as an arrow, but one end of the frame was much higher than the other end. Yet he seemed much surprised when told that his work was not finished. So he had to be shown how to do the work properly. He was also informed that if a frame is only lined, but not leveled, that all of the revolving parts will fall or lean toward the lower side of the bearings, and cause these parts to wear out on the low side. This is particularly true of the spindle bearings. It will be the same way with the shoulders of all the steel roll necks and of the cylinder bearing, etc. All of these will start wearing out on the high side as they heave heavily against the bearing edges on the higher side of the bearing.

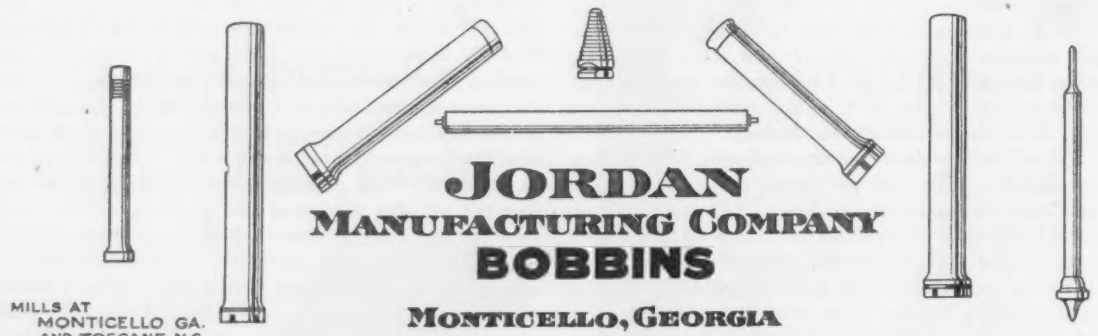
Again, if a bearing is not lined as well as leveled, the rolls will wabble and revolve in a snakey sort of fashion. This will cause much poor work, as well as wear out the bearings together with the roll necks and journals. It will also cause the steel rolls to frequently break. Enough has already been said to show the importance of having a spinning frame correctly lined and leveled. However it might be added that when spinning machinery is not leveled the ring rail will dip at one end and in this case it is necessary for the ring travelers to journey up grade on one side of the ring at each revolution. This is very undesirable as the traveler will not have a perfectly level course upon which to complete its journey around the ring. Part of the time it will be ascending and part of the time it will be descending, thus imparting a jerky motion instead of riding along with even keel or proper ballast, which is so necessary to preserve a uniform tension upon the yarn. It makes a vast difference about this important point in connection with leveling of spinning frames and the process of cotton spinning.

A variable grade on the ring race course will also wear out the travelers prematurely and cause the ends to break much more than they should. Even the rings will also wear out sooner.

How should a spinning frame be leveled? The proper way to level a spinning frame is first to level both ends—one end, then the other end. Second, if one end is found to be on a lower level than the end already leveled, it must be raised to the same level. The correct way to find out if one end is lower than the other end is to have a long straight edge. If this is placed upon the roller beam lengthwise of the frame, and a spirit level is placed on this straight edge, the instrument will indicate at once which end of the frame needs to be raised, when it is not level. The lower head will have to be raised, because it is better to do this than to cut into the floor which would be necessary if the higher end should be lowered to the level of the lower end.

This having been correctly done, the third thing to do is to line the front roll beams so that they will be perfectly straight to the line upon which the frame is to be permanently secured to the floor. This should be followed by lining the spindle rail. The front steel rolls should be lifted out of the bearings to leave the bearings clear and to facilitate the work. Now, a line must be stretched from end to end of the frame into the empty front roll bearings. This line should just barely clear the bottom center of the bearings. As a rule the bearings will sag more or less between the ends of the frame, but if there are any high points these must be dropped, so that the line is not touching at any point from end to end of the frame. The line which is used must be made of the strongest and best of materials so that it will stand being tightly stretched the full length of the frame without sagging at all.

This line should be stretched in the front roll bearings on both sides of the frame at one time. It will now be necessary to note the high and low points on both sides of the frame before proceeding with the work of leveling. The high and low points can be worked up or down in proportion as they affect the opposite side. For example, we will suppose that one side is all level. Now while the opposite side is being leveled, the first side which has already been



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leveled is liable to be thrown out of level again while leveling the second side. If one side is all level and the opposite side must be raised at one or two points (say one inch or so, and which is a great deal, but in many old mills it may be even more than this amount), raising one side of the frame one inch will also raise the opposite side a proportionate amount and throw off the good work already done. To make this clear, take a frame which is three feet wide, for example, if the front roll bearings are 24 inches apart, an inch on one side will cause the roll bearings on the opposite side of the frame to be raised about 3-16 of an inch. Therefore it can be seen that if one side has to be raised, the opposite side will have to be dropped or readjusted to meet the new conditions occasioned by the adjustment of the other side. The ideal way to work this job is to have two men work together, one on each side of a frame.

Having the top of the frame perfectly leveled, it is now important to level the spindle rail and the ring rail. The frame will now be in the right condition to have the spindles plumbed and lined and to adjust the rings to the spindles, also the thread guides.

In setting the spindes, we have another matter of "give and take;" if the spindles are set with the ring rail at the bottom, and the spindle is not concentric with the ring when the ring rail is at the top, the spindle needs to be plumbed. After it is plumbed it will have to be reset again at the bottom. The proper way is to set all the spindles at the bottom first, then the ring rail should be run to the top. All spindles which are out of center at the top will require plumbing and resetting again at both points, top and bottom.

The idea is to make positively certain that the entire frame is correctly set before giving up the job and calling it right. When an official knows how to do these things, it enables him to properly check up the work and prove whether the work is properly done or not. If the man in charge of this work does not know how it should be done, the people doing the work will soon find this out and anybody disposed to slight the "trying points" will pass over faulty work and get by undetected. Imperfect work of this kind bring about two evils, viz; paying out good money for having a job improperly done. Secondly frames that are improperly lined and leveled, waste oil, and make faulty work because they do not run so well. There will be an excessive amount of broken ends, which in turn make waste and also cause an imperfectly finished product. Machinery that is not finely lined and leveled consumes more power, belting and supplies. Also it entails much more repairing. The importance of this work cannot be too strongly emphasized. Keep the machinery well lined and leveled.

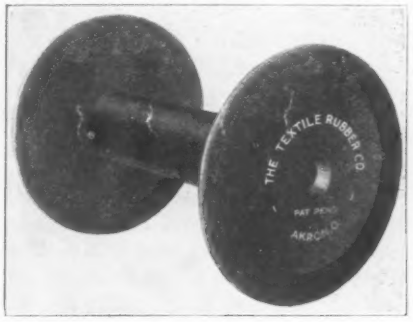
H. D. M. (R. I.)

A comprehensive and instructive book on "Electric Hoists and Overhead Cranes" has been issued by the Link-Belt Company of Chicago. It is profusely illustrated with photographs of actual installations showing some of the most recent Link-Belt electric hoist applications, and the subject of proper installation and efficient operation is fully covered. In print and picture, the booklet tells of the practices and methods employed by users in widely divergent fields. Copies of the book, which is known as Book No. 480, may be secured from any office of the company.

A Hard Rubber Spool for Mill Use.

Patents are pending on a new hard rubber spool for textile mill use. This spool seems to have overcome a number of disadvantages that were more or less inherent to the wooden spool. In the first place the heads and barrel are moulded from hard rubber composition in one piece so there is no possibility of a loose head developing after the spool has been in service for a period in the mill.

Then the composition of the material has been carefully compounded to produce the required toughness to prevent breakage when the spool is thrown in boxes or trucks, or inadvertently dropped on the floor. It was especially de-



signed to stand the rough treatment of continuous service, although its weight is approximately that of the wooden variety and is interchangable therewith.

Being of rubber composition it is not affected by moisture, either as a climatic condition, or that encountered in the conditioning room. There is no glue to become affected or softened, no swelling or shrinking through the variable moisture conditions that are frequently encountered.

This method of manufacture also disposes of the split and splintered spool head for all time and thus removes one more cause for worry and expense that will be thoroughly appreciated by the busy operating executive.

This hard rubber spool has been developed and placed on the market by the Textile Rubber Company, 225 Ohio Building, Akron, Ohio. This company was recently organized for the manufacture of this and other articles of rubber that may be used advantageously in the textile industry. At present this spool is being produced in the 4 x 6 size only, but the company expects to later develop the other standard sizes for mill work.

"Wash" Emphasizes "Trouble Man's" Remarks.

Editor Cotton:

I was very much pleased with the article entitled "Card Room Suggestions by a Trouble Man," which appeared over the signature of "S. R. K." in the February issue. I say I was pleased because "S. R. K." pointed out conditions as I have found them continually in the different mills I visit. His argument is similar to mine; he is unafraid to speak the truth.

As he says, "Many mills, I am sorry to say, could improve their work a lot by cutting down this waste" (referring to lap-ups on the back rolls of slubbers.) He gives us practical suggestions, too. The majority of mills are well managed, but some manage to exist in spite of such

April 5, 1923

BLEACHERS!

Better bleached cottons
are demanded by the public.

Solozone-processing
fills the bill at same cost, and avoids
the necessity of cutting prices.

Bleach your goods to a
permanent white without weakening,
of greatest softness and elasticity.

Let us show you.

THE ROESSLER & HASSLACHER CHEMICAL CO.
New York

conditions as those pointed out by "S. R. K." It was not so long ago that I found, in this state, slivers on the finished drawing that weighed 75 to 80 grains to the yard. I found also one mill running 1⅛-inch stock with metallic rolls, with a setting of 1¼ inches from center to center of the front and second rolls. What else can you expect but waste?

"S. R. K." strikes a very common evil when he says "I find that about 90 per cent of the mills use the emery fillet just about twice as long as they should."

I should like to suggest to the mill man reading this article that he go *now* and examine his grinding wheels. It's a 100 to 1 shot he will find them shining with oil in spots. In some cases I have found, I could see little emery. However, what "S. R. K." states proves that I have not exaggerated the conditions I have found in many mills, as described in these columns. It proves, also, that the contributors to this department are all live wires. Again, it proves what a help COTTON is to the industry.

To prove what I say, let us assume that a few managers will sit up and take notice of "S. R. K.'s" splendid article, and will immediately examine the grinding wheels and find them in the condition described. They will order them recovered at once, which means a stronger and better looking web from the card. In other words, the work is improved in many mills through the aid of COTTON.

Wash (R. I.)

Progressive overseers and superintendents are eagerly seeking the experiences of others as told in COTTON or they cease to progress.

Southern Textile Association To Meet At Asheville, June 22 and 23.

Program plans are being prepared for the annual meeting of the Southern Textile Association, which will be held on Friday and Saturday, June 22 and 23, at the Battery Park Hotel, Asheville, N. C. James A. Chapman, Jr., vice president of the Association and chairman of the program committee, is arranging some unusually interesting features for the meeting in an endeavor to make it the best gathering of the organization ever held.

Among the new features to be introduced at this meeting will be an Association banquet on Friday evening, June 22, at which a prominent mill man will speak, dealing with a subject of particular interest to the operating executive members of the Association.

At this meeting reports from the chairmen of the carding and spinning divisions will be made regarding the meetings of these divisions held since the semi-annual meeting in Greenville in October; these will be of especial interest. C. E. Carpenter, of Philadelphia, will also be one of the speakers.

R. W. Jennings, of West Point, Ga., who is general chairman of the Textile Operating Executives of Georgia, will make an address at one of the sessions, telling of the activities of the Georgia organization, which was formed for the conduct of discussion meetings in the state of Georgia on the plan of those originated by the Association in its sectional or departmental meetings.

A number of matters of importance, including the annual election of officers, will be taken up at this meeting,

and this fact, together with the selection of Asheville as the meeting place, is expected to draw a record-breaking attendance. A number of the members have indicated their intention to bring their wives to this meeting.

Any members whose names are omitted from or whose addresses are incorrectly stated in the Association year book, are requested to send their correct addresses to A. B. Carter, Gastonia, N. C.

Permanganate of Soda as a Bleaching Agent.

(*Continued from page* 538.)

the sulphurous acid (sulphur dioxide) is set free to act as the bleaching or rather the reducing agent. Sodium hydrosulphite is superior to the dioxide inasmuch as the white produced is permanent whereas the white produced by the dioxide is more or less transitory and will go yellow again in time.

The bleaching action of permanganate only becomes apparent on treating the stained material with sodium bisulphite, or sulphur dioxide, or hydrosulphite. The powerful reducing action of this reagent converts the manganese dioxide into maganese protoxide, the sulphurous acid being at the same time oxidized to sulphuric acid, with which the Manganese protoxide forms the readily soluble and almost colorless salt, manganous sulphate, which can be easily removed by washing. The sodium permanganate solution can also be used, together with a little sulphuric acid, in the cold, for some styles of goods. In this case the material is not stained brown, since the manganese dioxide formed is at once converted into soluble manganous sulphate. In this case the bleaching action of the permanganate is supplemented by that of the oxygen liberated by the decomposition of the oxide.

Addition of magnesium sulphate to the bleaching liquor, referred to as necessary, in bleaching wool or silk, on account of the formation of caustic soda during the decomposition of the permanganate, neutralizes the alkali, with the formation of neutral sodium sulphate and insoluble magnesium hydroxide. Hence no injury can happen to the fiber.

In bleaching cotton, yarn or pieces, linen, jute or any other vegetable fibrous materials, the addition of any magnesium sulphate is unnecessary.

Another method of bleaching with permanganate, as we have already shown, consists of rinsing the material, on which the manganese hydroxide has been deposited, and then treating it for about ten minutes with a very dilute solution of hydrogen peroxide in place of sulphur compound. This treatment is followed by souring lightly with sulphuric acid and then thoroughly washing. In this method the manganese dioxide decomposes the hydrogen peroxide, by simple contact, into water and oxygen, the latter exerting a further bleaching action in its nascent state. In the after-treatment with sulphuric acid the manganese protoxide (formed from the dioxide) is converted into the readily soluble manganous sulphate, which is subsequently washed out in the final washing in water.

Linen may be bleached by boiling ten hours in three per cent caustic soda, washing and souring, washing and then boiling eight hours in soda ash, wash and steep five hours in permanganate of soda at three degrees Tw., wash and run in a weak acid solution of hydrogen peroxide or a two per cent solution of sodium bisulphite, sour and wash. Or the goods, if not too heavy, can be boiled in the soda ash after the permanganate instead of before.

For bleaching jute, ramie and similar vegetable fibers, the material is first steeped overnight at a temperature of 149 degrees F. in a solution of five per cent carbonate of soda and after being drained is immersed in a five per cent solution of sodium permanganate. At the expiration of half an hour, the goods are taken out and worked in dilute hydrochloric acid, containing a little sodium bisulphite or hydrogen peroxide, followed by washing in cold water.

A first-class white, which will not alter on exposure to the air, can be obtained with the permanganate process, by first treating the suitably cleaned jute or other vegetable fiber for three or four hours in a solution of hypochlorite of soda at two degrees Baume; the goods are then washed and soured and squeezed or wrung and then steeped for one hour in a 1½ per cent solution of permanganate of soda, and then thoroughly washed. The material which is now stained brown, is entered into a bath of sodium bisulphite, prepared with 950 parts water and 50 parts of bisulphite (at 38 degrees Baume) and is left there for about three-quarters of an hour. The bleached material is thoroughly rinsed and then entered in a soap bath, consisting of a ½ per cent of soap and a little bluing. In this bath the jute is treated for fifteen or twenty minutes, and acquires an improved luster. A little sulphuric acid should be added to the bisulphite bath.

Skins, straw, ivory, etc., may all be bleached with permanganate of soda and there is no reason why permanganate of soda should not become a commercial bleaching material and at a price which will make it economical to use; at any rate for all goods except, perhaps, cotton.

Permanganate of potash is too expensive and out of the question, but permanganate of soda, being a fifty-fifty mixture of manganate of soda and crude Epsom salts, both cheap products, ought to be largely used, especially for wool and silk and other special lines, and even for fine cottons.

In all of the processes given in this article, the permanganate solution is used lukewarm, unless otherwise specified.

That Flyer-Lead Frame.

EDITOR COTTON:

In his article entitled "The Work—Not the Frame," in the December issue, "K. (O.)" puts me down as an "old timer." I accept the compliment, and offer the following proof that the "old timers" have it on the later generation. Remember: Folks who can, do; those who can't, chin."

The flyer is an old idea. It was invented in England, and it has been possible for the English flyer to dominate the situation for the past seventy years.

Again, the idea of having back tenders in the card room was an old idea, but was it not a good one for mutual benefit in all card rooms?

At the present time we have doffers, and when there is no doffing they often waste their time by fooling it away. In the old days a back tender would tend four to six backs. They had to doff when a frame was doffing. So the cost was no higher than now. But the "old timers" were training these back tenders for future speeder tenders.

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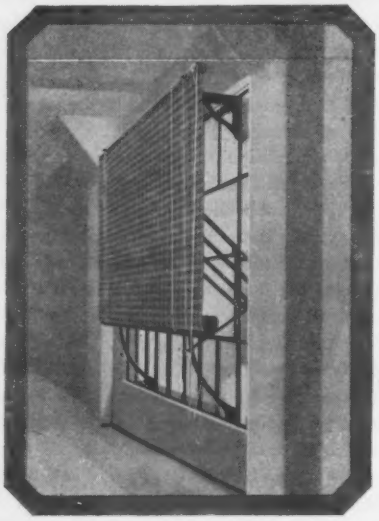

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Will not interfere with center swing ventilators. Easy to apply to any sash. RA-TOX Shades cost no more than the ordinary kind.

Write for complete information.

HOUGH SHADE CORPORATION

Industrial Shade Division

300 Mills Street **Janesville, Wis.**

At present, we must take a doffer from doffing and put them to running frames, at the same time they know little or nothing about creeling.

"K. (O.)" may be surprised to know that the old flyer-lead Lowell frame (single row) holds the record to this day for turning off the largest production per spindle. The cost per pound being much lower, too.

Wash (R. I.)

A Partly Split Loom Pulley.

D. C. Leonard, 94 Morris St., Greenville, S. C., has developed a partly split loom pulley for meeting the demand for a pulley that will not, after several years service, become loose and worthless, and at the same time prevent the crank shaft of the loom being discarded on account of a worn portion at the point where the solid hub pulley is used. An important feature of the new pulley is that it is interchangeable, and can be taken off or put on without removing the crank shaft from the loom, thus eliminating the use of the hydraulic press for this purpose. Considerable trouble is often experienced with solid hub pulleys from this source. Solid hub pulleys sometimes becomes loose on

PATENT PENDING

the crank shaft and practically always in order to make a permanent repair, a new pulley and crank shaft is necessary, also involving a loss of production by the stopping of the loom.

This new pulley is split from rim to rim, the hub and web are made sufficiently flexible to provide positive permanent compression on the crank shaft by the tightening of the compression bolts. To get the best results from the clamping bolts, it is pointed out, it will be necessary to tighten all of the bolts and then tighten the set screws firmly upon the key. The weight of the pulley is said to be practically the same as the solid hub pulley.

H. Wonderlich Company, 2814 North 4th Street, Philadelphia, are now making for the textile trade a line of Wonder fiber brooms which they believe to be superior for the difficult service to which such brooms are subjected in the mill. The brooms withstand atmospheric changes without deterioration, it is claimed, and are therefore excellent for either wet or dry use.

Caring for Roving Frames.

Editor Cotton:

I would like to give my views on the care of roving frames. To begin with, of course, all roving frames should be properly erected, lined and leveled, and in good condition. In taking care of the frames, first, they should be carefully oiled once a day, that is, all fast gears—meaning all gears on the jack shaft, bobbin shaft in the head end gear box, top and bottom rail, top cone shaft, bottom cone, twin gear, etc. All slow moving parts should be oiled twice each week with heavy engine oil. Steps should be oiled once each month, mandrels or arbors every two weeks, using a good non-fluid oil. They should be taken out and wiped clean every two weeks, and the oil should be applied on Monday morning and the frames started at once.

So much as been written about setting rolls that I will not discuss that, anyhow the roll settings depend on the length of cotton being used, the drafts, etc. Bottom rolls should be taken out and cleaned at least twice every year, the flutes should be cleaned very carefully, each joint examined and all that are worn should be repaired and all stands reset and tightened up. A good lubricant should be used, placing a little on top of each roll neck after being replaced. Top rolls should be gone over by the section man each Monday morning, and all bad rolls taken out and replaced by new ones. Back or solid rolls should be replaced as often as needed by selecting the best ones from the middle and placing them on the back row.

In taking good care of roving frames, an important feature is to not run at an excessive frame speed. The best results, in my experience, have been received from the following flyer speeds: slubbers, 750 r.p.m.; intermediate, 950 r.p.m.; speeders, 1,250 r.p.m.; and jacks, 1,350. Excessive speed is detrimental to any piece of machinery.

The section man should be required to go over the frames once each week and see that all gears are set properly, tightening all loose bolts, as a small thing like this can save many a large one latter on.

Now as to the operation of roving frames, the very best help should be selected and should be taught allegiance and obedience in a kind way—that quality and production are the two essential things in the operation of roving frames; that badly pieced ends on slubbers cause trouble on the intermediates and so on through to the speeders. In piecing an end, just enough twist should be allowed to get the roving through the flyers, wrapping three times around the presser, thereby saving a tangled bobbin of roving. Frame hands should be required to clean the top rolls once each day, pick the spindles and clean the backs once each day, guides should be wiped twice each day, top clearers cleaned four times each day. In creeling frames, operatives should be taught to piece the ends evenly. All roving should be pulled off the bobbins instead of cut. All skewers with blunt ends or nails driven in the ends should be discarded and replaced with now ones. All roving should be marked a separate color for each set to find where bad work is coming from. Frame hands should be required to oil spindle and bobbin gears once each day. Care should be taken in doffing to see that flyers are all placed down firmly on top of the spindles and that ends are wrapped the correct number of times around the presser, thereby insuring a good firm bobbin of roving.

Section men should be required to look over each frame once a month to see that tensions are tight. All new bobbins should be calipered, those that are above or below size should be discarded. Endless cone belts with rider should be run on all frames as broken cone belts cause a lot of trouble. Frame hands should never be allowed to doff a frame and start a new set with ends broken back. For instance, in a mill with 40 frames and with one spindle stopped to the frame, an enormous amount of production is lost. B. A. B. (N. C.)

Fulton Supply Company's New Home.

Fulton Supply Company, Atlanta, Ga., have established their headquarters in their new building at 70 Nelson Street. This structure, shown in the accompanying illustration, was designed with the idea of handling in an efficient and modern manner the usual stocks carried by mill supply houses. The building has three floors, with a total of 45,000 square feet of area. The basement adjoins the railroad track and has a ceiling about 20 feet high, and concrete floor. In this space stocks of bar iron, pipe, cold rolled shafting and similar material is stored on end. One of the elevators is 22 feet long, accommodating full lengths of pipe, long lathes or bulky material. The management considers that the arrangement of the building gives them an ideal supply house which should meet their requirements for some years to come.

Combustion Engineering Corporation, Ltd., and the Uehling Instrument Company have recently entered into an agreement whereby Uehling interests in the Dominion of Canada and Newfoundland will be handled exclusively by the Combustion Engineering Corporation, Ltd., with principal offices located in Toronto, Montreal, Winnipeg and Vancouver.

J. S. Cothran, of Charlotte, N. C., is the representative of The Superheater Company, 17 East 42nd Street, New York City, in North and South Carolina, according to an announcement by the company, which states it is thus in a position to render high grade power plant engineering service in the application of superheaters for stationary boilers.

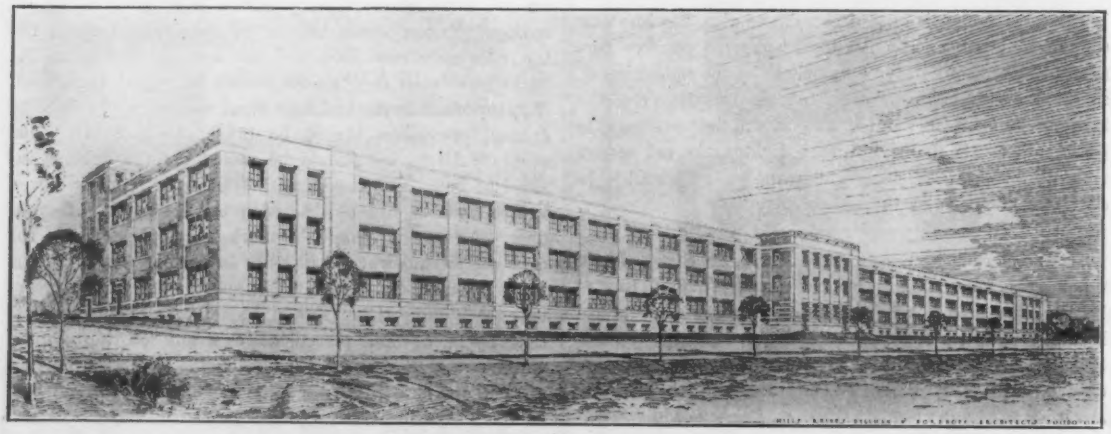
A Modern Factory Building.

Ground has been broken for the construction of a new plant unit for The DeVilbiss Mfg. Co., Toledo, Ohio, makers of the widely used DeVilbiss spray-painting system, which will call for an expenditure of $1,000,000, including equipment.

This new unit of fireproof brick and concrete construction with four stories, will be 580 feet long by 80 feet deep and will face on Phillips Avenue, southeast of present buildings, and lie between Detroit Avenue and LaGrange Street. The structure is the first of two similar buildings to be constructed on the Company's fifty-five acre factory plot to afford more adequate plant room and improved production facilities for the rapid and substantial expansion of the business. The completion of this first unit will also enable the DeVilbiss concern to effect a more efficient grouping and consolidation of the several manufacturing divisions of the business, now located at this point and in other parts of the city.

Among other special appointments, rest rooms and a cafeteria will be provided in the new building. While tennis courts, baseball diamonds and other recreational features will be maintained on a more elaborate scale in the park-like setting the city factory site presents.

The DeVilbiss company expects to occupy the new building within six months.

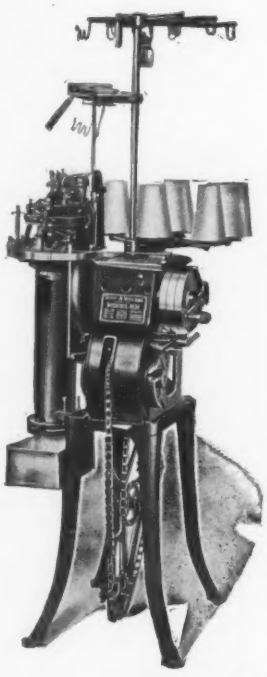


New Plant Unit of The De Vilbiss Mfg. Co., Toledo, Ohio.

KNITTING SECTION

NEW MODEL H-H

Producing Ribbed Top Half Hose Complete



Ribbed top made on two sets of needles.
Automatic transfer from ribbed stitch to plain.
Eliminating necessity of skilled help.
Saving of raveling waste which occurs when topped by hand.
Each stocking is dropped from the machine when finished.
Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.
Machine is fitted with five yarn fingers.
Provision is made for high spliced heel and double sole.
Provision is made for ring top and ring toe.
Speed of machine about the same as Model K.
Production about twelve stockings per hour on 3¾" 220 needles.
One operator can take care of the same number of machines as Model K.
The machine is built in all gauges.

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Mercerized Yarns

20s—80s Two Ply
NATURAL AND GASSED

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Knitters Meet at Philadelphia

National Association of Hosiery and Underwear Manufacturers Hold Annnal Convention and Exhibition at Commercial Museum

Considering subjects of intimate concern to the industry, and marking the conclusion of a term of marked activity on the part of the Association's officers, the annual convention of the National Association of Hosiery & Underwear Manufacturers, held in Philadelphia on Wednesday and Thursday, April 4 and 5, was considered one of the most successful and effective meetings conducted by the organization.

In accordance with custom, the convention was held during the week of the Knitting Arts Exhibition, at the Commercial Museum, and this year the location of the meeting hall was changed to the exhibit hall, a feature upon which much favorable comment was heard. This allowed an inspection of the exhibition and attendance at the convention sessions under one roof with considerable convenience. The former objection of noise from machinery in the exhibition was eliminated this year by making power unavailable to the machinery during the hours of the convention sessions.

That the change of location did not detract from the attendance at the meeting was apparent from the unusual number of members present at the two sessions.

Joseph H. Zens, the president of the Association, was the presiding officer at the convention sessions. Mr. Zens'

JOHN NASH MCCULLAUGH, NATIONAL SECRETARY AND INDUSTRIAL MANAGER.

annual report, made at the Wednesday morning session, was very interesting as it reviewed briefly the major activities of the Association during his first term of office.

The First Session

was brought to order by President Zens shortly after 10:30 Thursday morning. This session included Mr. Zens' report, an address by Nelson B. Gaskill, of the Federal Trade Commission, on "Labeling," and a talk by John Wyckoff Mettler, president of the Interwoven Stocking Company, on "Selling to the Retailer."

President's Annual Report.

Mr. Zens' report was as follows:

It is with a great deal of pride that I am here this morning to give you an account of my stewardship. During the eleven months that have elapsed since you elected me as your president the work of the Association has grown apace and the concrete accomplishments have reached such substantial proportions as to excite the admiration of all branches of the textile industry. In this short space of time

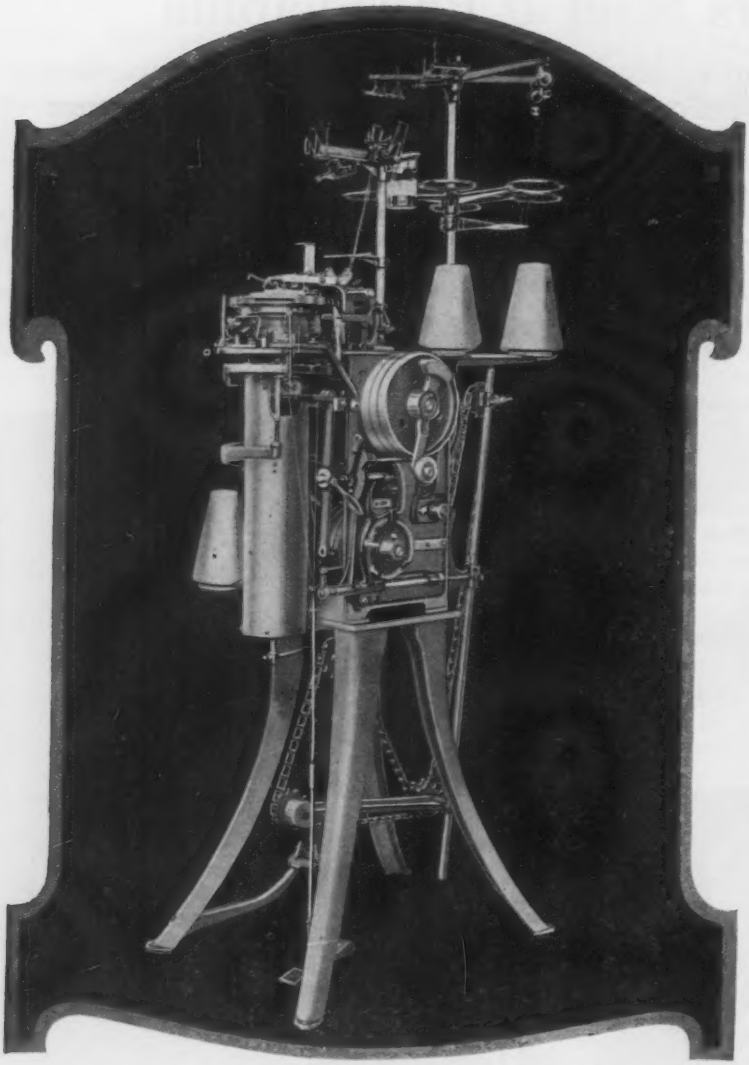
JOSEPH H. ZENS RE-ELECTED PRESIDENT.

we have bridged the gap between comparative mediocrity and leadership.

Before I pass from generalities to a more detailed recital of the progressive movements that have been initiated during the last eleven months, I wish to put on record my sincere appreciation of the consistent and conscientious support of my administration that I have received from the members of the Board of Directors. Several meetings have been held in New York City and although attendance meant traveling hundreds of miles for the majority of members, each meeting was more than well attended. A splendid spirit of cooperation prevailed at all times.

The benefits that now accrue from membreship in this association are such that no hosiery or underwear manufacturer can afford to stay without the fold and do full justice to himself or his business.

Trade associations in recent years have been more or



Wildman Spring Needle Knitter

Are you considering the purchase of hosiery knitting machines?

The name "Wildman" represents conscientious effort of over a generation devoted entirely to building and improving high grade knitting machinery.

Wildman Knitters will make the high spliced heel, reinforced heel and toe, ring toe and double sole with entire satisfaction.

We are now able to sell Wildman Spring Needle Knitters in all foreign countries.

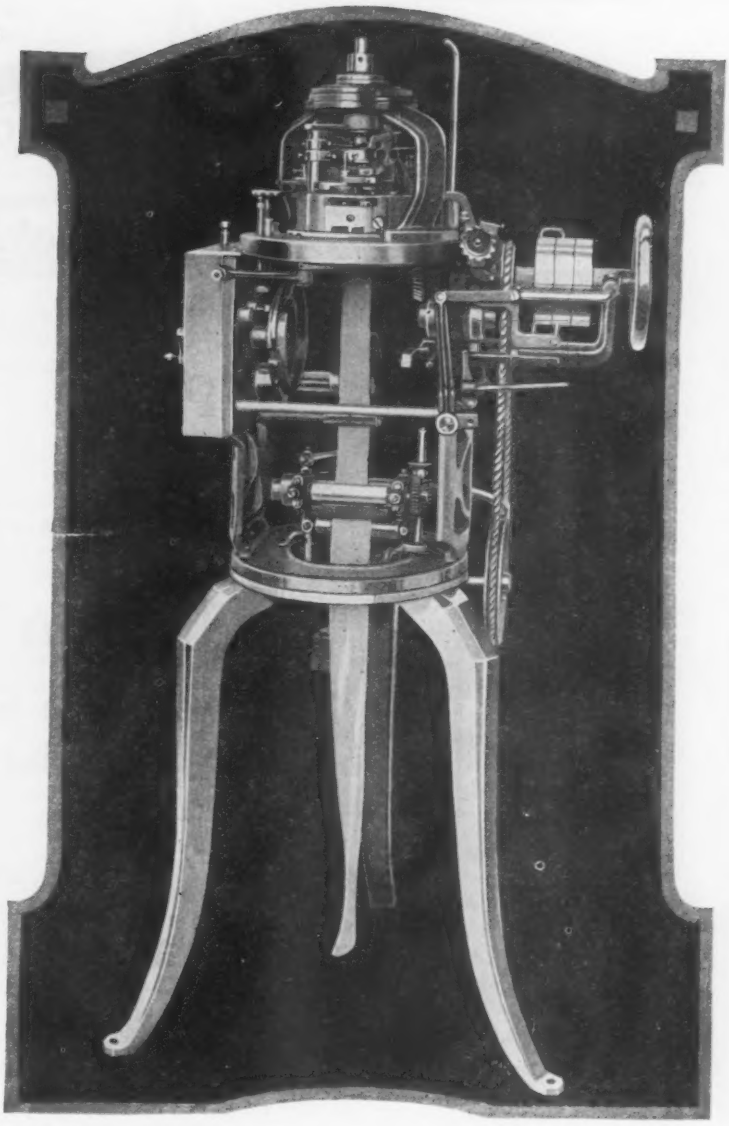
On request we will send the "Wildman Spring Needle Knitter Machine Instruction Book" giving detailed information and description of every important part of the machine.

We have issued a very complete and informative book—"The Science of Knitting" Price $3.00.

WILDMAN

THE WORLD'S STANDARD

The Wildman Ribbing Machines



Accuracy of operation is one of the qualities that has made Wildman Circular Knitting Machinery the standard in the knit fabric industry.

For instance, cylinders and dials on The Wildman Circular Ribber are machined to within three thousandths of an inch. Other parts are made with corresponding care. All are absolutely interchangeable.

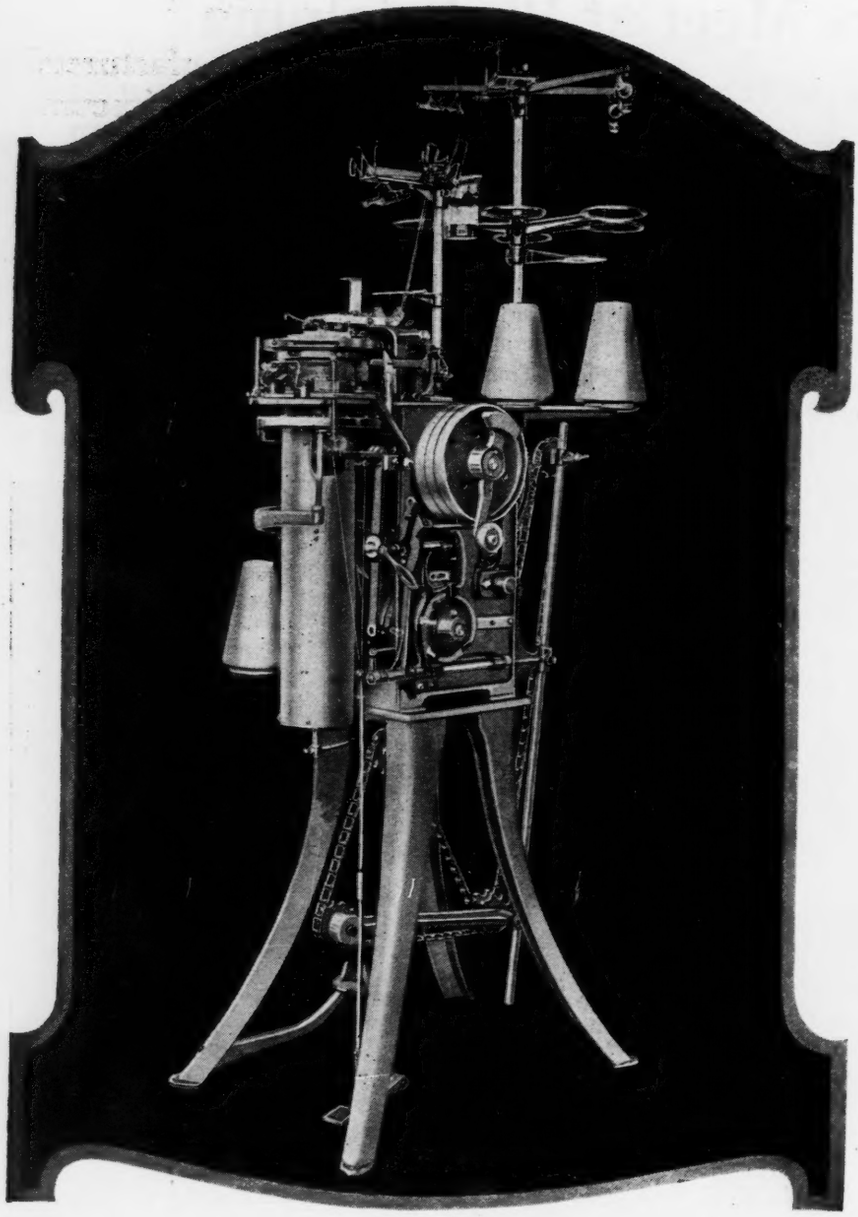
Wildman Ribbers help manufacturers to knit fabric of finer and smoother quality.

On request we will send the "Wildman Ribber Catalogue" giving detailed illustrations and descriptions of every important part of the machine.

TRADE MFG MARK

WILDMAN MFG. CO.

NORRISTOWN, PA.



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WILDMAN

THE WORLD'S STANDARD

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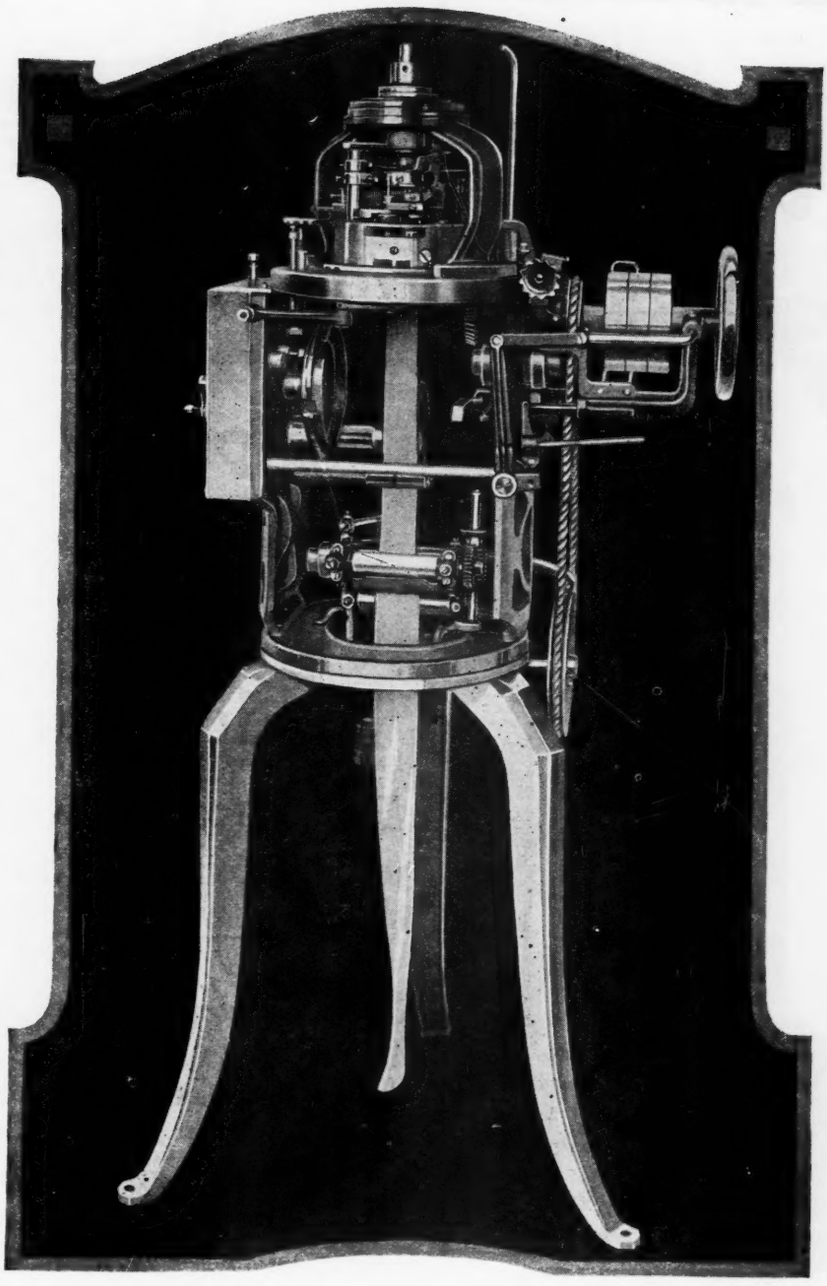
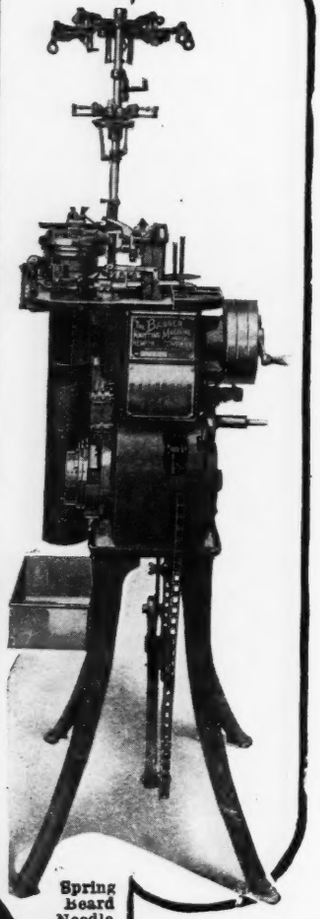


TRADE MFG MARK

WILDMAN MFG. CO.

NORRISTOWN, PA.

The Banner Full Automatic Hosiery Machines



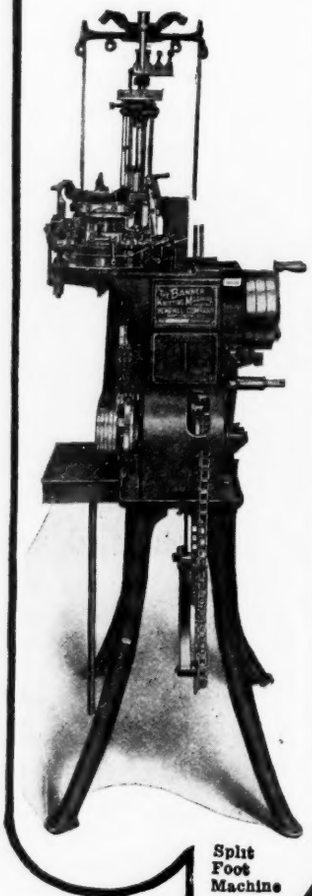
Spring Beard Needle Machine

Simplicity
Quality
Speed
Production

All Parts Accessible from the Front of Machine

We have just placed on the Market two new models—The Spring Beard Needle, built in sizes of 3" to 3 3-4" diameter, and a new model —Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

Write for descriptive catalog



Split Foot Machine

HEMPHILL COMPANY

MAIN OFFICE AND FACTORY PAWTUCKET RHODE ISLAND

TRADE MARK

SOUTHERN OFFICE and SHOW ROOMS
912 James Bldg.
CHATTANOOGA, TENN.

PHILADELPHIA OFFICE and SHOW ROOMS
208-9-10 COLONIAL TRUST BLDG.
PHILADELPHIA, PA.

less on trial. No longer will responsible business men identify themselves with organizations whose sole purpose or excuse for existence is to get together annually for the sake of patting each other on the back and accumulating a morning-after headache.

The successful trade association of today must contribute constructive thought and accomplishment to the industry that it represents. It must function as a business entity, and at all times avoid becoming an instrument of petty politics.

Your officers have all fully realized these facts and the policy of the association has been shaped and has functioned along these progressive lines. I have no hesitation in saying that the strides made by this Association during the past year and the work consummated will have a great and far reaching effect upon the knitting industry at large. We have tried to build for the industry a service bureau complete in every detail, to which members can submit any and all of their industrial problems in the knowledge that their needs will be met promptly and efficiently at all times.

The keynote of the association's central office is courtesy. The secretary and his staff strive to give Service with a capital "S." The only complaint that I have to make with regard to the central office is that members do not use it more frequently. I would urge upon those of you whose interest in the association has become somewhat superficial to avail yourselves of the full service your organization offers. If there are any of you who are permitting ancient animosities or petty politics stand in the way of taking full advantage of the association service I urge you to brush them aside and permit your unbiased business judgment to pay tribute to your association's unrivaled contribution to industrial progress.

I will now specifically call your attention to a few facts:

In one year's time your association has presented a complete and uniform cost system to its members. This cost system is the result of exhaustive research combined with expert technical knowledge, and is applicable to all classes of mills, large or small. This report has been more or less a life saver to several mills who had previously operated on a hit or miss system.

The Association has established and operates an Exchange Bureau for the disposal of surplus materials, and during the past year members benefitted to the extent of more than $200,000. No extra charge or commission is exacted for this service.

To my knowledge our association is the only trade organization that is today collecting past due accounts for members free of charge. On the basis of present operations more than half a million dollars will be collected during 1923.

The Association has established and operates in conjunction with the United States government, a research laboratory in the Bureau of Standards, the results from which have been and are, far-reaching in savings and information, too great to be measured in dollars and cents. At the present time there are a number of problems being studied with a view to standardization that will continue to benefit the members for at least five years to come. In this connection I invite you to inspect the association's exhibit in the Exhibition Hall at Booth No. 24.

I have been asked by several manufacturers of seamless hosiery what my attitude is toward the proposed advertising campaign of the full fashioned hosiery manufacturers, and to what extent it was the desire of the administration to permit the central office of the Association to participate in any such activities.

Of course, the majority of you know that I am a manufacturer of seamless hosiery exclusively. At a meeting of the Board of Directors held in New York in January last, at which meeting there was only one manufacturer of full fashioned hosiery present, the question was thoroughly discussed. Gentlemen, in discussing whether or not it was advisable to permit the association office to cooperate with the manufacturers of full fashioned hosiery, we realized that whether or not they were members of our association, the manufacturers would have a campaign, if they so desired, whether we cooperated or not. Therefore we came to the conclusion that cooperation was better than strife. In this respect I would call your attention to a resolution adopted by the Board of Directors at that time:

> Whereas: The full fashioned members of this association contemplate a publicity campaign, and the secretary of this association has been consulted relative thereto, therefore be it
>
> Resolved; That the Secretary be authorized to serve the full fashioned hosiery manufacturers, and place the facilities of the Association office at the disposal of the full fashioned group; and be it further
>
> Resolved; That all expenses incidental thereto be charged to the group, and that no expense or liability be assumed by the National Association of Hoisery & Underwear Manufacturers.

I am frankly of the opinion that any advertising campaign on the part of the manufacturers of full fashioned hosiery will be beneficial not only to them but also to manufacturers of seamless hosiery.

We all know that bell-ringers have carried on a campaign of deceit at the door of the American housewife for more than a year. We know, from the sales of one of the largest operators in this field, of the success achieved temporarily by misrepresentation.

Now it is my feeling in this matter, that, if the American woman can be thoroughly informed as to what a pair of full fashioned stockings is, she will resent the advantage that has been taken of her gullibility by the P. T. Barnum sales methods employed by the bell-ringer, and once more will make her purchases in the proper economic channel of distribution—her local store. Frankly, the only thing that I can see that will accrue to the seamless hosiery manufacturer from this campaign is benefit, because, no condition economically filled with ambiguity and doubt as exists today in the hosiery industry can continue successfully.

As an association we have voiced and repeatedly expressed our desire to be fair in the marking of our merchandise, and we drew up a schedule of uniform labeling that was approved and adopted by the Federal Trade Commission. Having gone on record in favor of honesty, we should indeed be obliged to any group that starts a campaign against dishonesty which will eventually benefit all of us.

In conclusion I would more than urge upon you the advantages to be gained by participating in the full service your association offers. We stand upon the threshold of even greater accomplishments and it only needs your cooperation and support to place the association in the front rank of organizations which function one hundred per cent as economic entities for the benefit of industry. I am in-

THE MERROW MACHINE CO.

Established 1838

16 LAUREL STREET, HARTFORD, CONN., U. S. A.

MAKERS OF

The Merrow High Speed Overseam Overedge and Shell Stitch Machines

FOR FINISHING ALL KINDS OF KNIT AND WOVEN FABRICS

Catalogue and Samples upon request.

MERROW

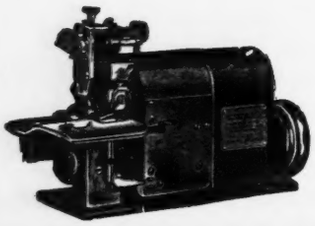
Reg. Trade Mark

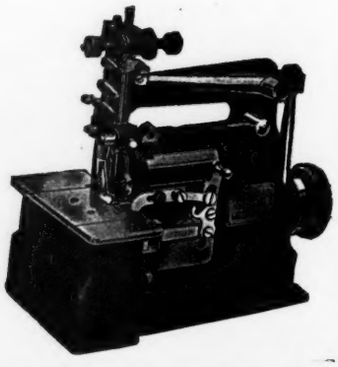
BRANCH OFFICES AND DISTRIBUTING CENTERS

467 Broadway, corner Grand St., New York.
Sixth and Arch Sts., Philadelphia, Pa.
815 W. Van Buren St., Chicago, Ill.
417 W. Baltimore St., Baltimore, Md.
77 Bedford St., Boston, Mass.
1673 Oneida St., Utica, N. Y.
408 Central Building, Rochester, N. Y.
5 Manning Arcade Annex, Toronto, Ont., Can.
212 McGill St., Montreal, P. Q.
86 Third St., San Francisco, Cal.
434 Shelby St., Detroit, Mich.
1234 Superior Ave., N. E., Cleveland, O.
1420 Olive St., St. Louis, Mo
908 Magazine St., New Orleans, La.

FOREIGN DEPOTS

Leicester, Paris, Brussels, Boras, Barcelona, Turin, Sydney, Melbourne, Shanghai, Basle, Hong Kong, Rio de Janeiro.





deed proud of the splendid results that have materialized during my term of office.

And one word more. At the present time hosiery and underwear manufacturers generally are enjoying good business but it is well that we do not permit prevailing prosperity to stultify our sense of proportion. Let us proceed with care, avoid speculation, overbuying and over production so that those dark days of 1920 will never be repeated.

Address of Mr. Gaskill.

Following his own report, President Zens presented Nelson B. Gaskill, member of the Federal Trade Commission, who spoke on the subject of "Fair Labeling." The first part of Mr. Gaskill's paper dealt with the ethical relationship of truth and trust, and applying this thought in a practical way to the representation a manufacturer places upon his merchandise, he continued:

"Now the manufacturer always knows or can know the truth about his products. He knows or can know without the least doubt, what he puts into them. That knowledge imposes upon him the burden of being true to the buyer's trust. For mark you well, the man who is false to another's trust in his sense of truth is false to his own sense of truth as well. The buyer may suffer loss through this deception but the seller loses also. Like produces like. Action and reaction are equal. Or to put it another way, 'Whatsoever a man soweth, that shall he also reap.' The practice of deception brings deception back upon the individual as certainly as two and two make four. Take the career of P. T. Barnum, probably the greatest example of the faker. He was the victim of other fakers who took from him all he ever made by deception. What was permanent in his success was due to acts which did not rest in deception. The concert tour of Jenny Lind was a bona fide enterprise and that great singer gave honest value for every dollar that went into Barnum's hands. His circus became a great spectacle, not because of a few fakes like his sacred white elephant, but because of the sheer merit of his menagerie and his performers. Barnum succeeded where he was honest and failed to the extent that he was dishonest thereby proving that his maxim 'The public likes to be fooled' held good only insofar as it included himself.

"I don't want you to think that this matter of truth in labels, brands and advertisements is merely a question of policy or is the injection into the placid current of business life of an interfering agency. Try to build a bridge in defiance of the known laws of the strength of materials, of stress, strain and thrust and the relation between these and the load it is to bear. You know it will fall. And that failure is because the true principles of bridge building, either in ignorance of them or wilful departure from them, were not applied. This is what I am trying to show you, that there are true principles, laws of truth which apply to the building of business houses as well as bridges and deception in the operation of making and selling goods is as much a weakness as in building a bridge. Honesty is not the best policy; it is the only principle of real and stable success, and departure from it is not an alternative road to success but leads to a false result.

"Let us turn now to the practical application of this reasoning together about trust and truth, to your problem of labels, brands and advertising. As I said before, you are charged with knowledge of what goes into your products. In the opinion of the United States Supreme Court in the case of the Winsted Hosiery Company vs. The Federal Trade Commission, are laid down the governing rules which may be stated thus:

"1. A manufacturer is not compelled to disclose the composition of his product.

"2. If he does disclose it or makes any representation about it, he must tell the truth about it.

"3. The test of the truthfulness of his disclosure or his representation is not the impression made on the mind of the skilled trade buyer but rather the belief of the uninformed, untrained public.

"A brand is a mark or device impressed into or upon a commodity or woven into it so that it becomes part of the commodity. Its true purpose is to carry to the consumer the identity of the commodity or its origin. A label is something detachable from the commodity but affixed to it in such form that it can be removed or obliterated, or it may be affixed to the container. Each of these may also be an advertisement or the advertisement may be in any other form because to advertise is simply 'to give notice or information.'

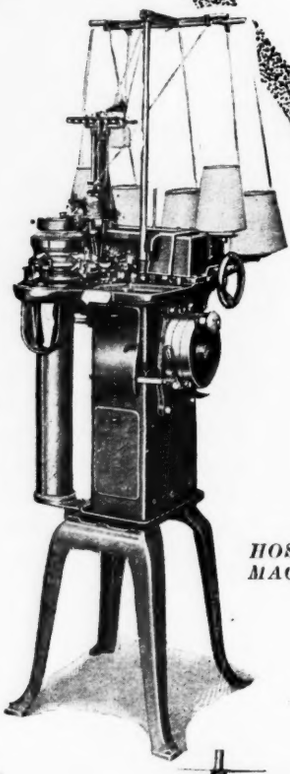
"Therefore under the first rule of the Winsted case a brand or label which states merely the maker's name and place of manufacture, a number indicating the line or type or style, number indicating the device such as a star, triangle or animal peculiar to the maker and such descriptive nouns as 'Ladies' Hose,' 'Men's Underwear,' without anything which describes or identifies or refers to the material of which the product is composed, contains all that the law requires. Articles so branded or labeled pass on their appearance and on the maker's reputation. If any subsequent dealer misrepresents them, the responsibility rests upon him alone.

"To illustrate the application of the other rules let us consider a silk stocking. The truth about silk is that nothing is silk except that which comes from the cocoon of the silk worm. No other substance can be silk just as one and one cannot be anything but two. A silk stocking therefore cannot be anything else than a stocking the whole of which is entirely and exclusively composed of silk produced from the cocoon of the silk worm. That is the truth, the whole truth and nothing but the truth about a silk stocking. And that is precisely what the word silk means when a manufacturer adds the word silk to his brand, label or advertisement. That is precisely what the public expects to get and has a perfect right to expect to get under the representation because it is the truth. It makes no difference that the trained buyer would know that the stocking was made of cotton. By using the descriptive word 'Silk' the manufacturer has gone beyond identification or indication of origin and has entered the field of representation. This voluntary assumption on his part has created an obligation upon him to be true to the trust of the buyer in the truth of the representation.

"There arises in consequence the question as to proper representation of a stocking, the top, heel and toe, possibly the sole of which are of cotton while the remainder is of true silk. The cotton never can be silk therefore the stocking is not all silk. 'Silk' used alone is generic, it includes and applies descriptively to all or the whole of the article to which it is applied. Therefore a stocking parts of which are

RESULTS
That Assure Greater Profits

RIBBER



HOSIERY MACHINE

THE worthy knitted products that result from BRINTON Knitting Machinery are building a national reputation for knit-goods manufacturers who are BRINTON users. The fabrics that Brinton Machines knit possess that quality in texture and appearance that assure greater sales and greater profits.

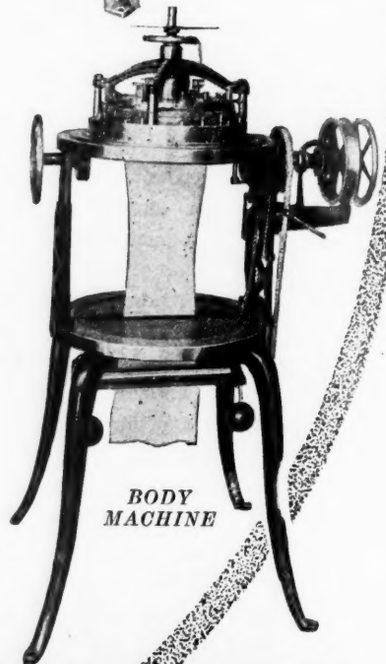
Then, too, Brinton Machinery assures economy in manufacture by assuring maximum production with the lowest percentage of seconds and waste.

The Brinton Line is complete—each machine the result of specialized experience of an old established manufacturer and the most perfect machine possible for that particular kind of work.

You can't go wrong on a BRINTON Machine. It will give you results that assure you greater profits and greater prestige in the knit-goods field.

Samples, prices and particulars on request.

H. BRINTON CO., PHILADELPHIA



BODY MACHINE

Samples and Prices on Request

BRINTON
KNITTING MACHINERY

cotton can never be in truth, a silk stocking and any representation of it as 'silk' only, is not truth but falsehood. Since to call it 'silk and cotton' confuses it with hose woven of threads in which silk and cotton are twisted together producing an entirely different result, the term 'silk boot' or 'silk leg' is generally accepted as indicating the necessary distinction that the Federal Trade Commission regards this as proper labelling.

"Let me call your attention here to a most pernicious practice of double dealing, an attempt to tell the truth and to deceive at the same time.

"One cannot assert an all inclusive affirmative and then qualify it with a limiting negative if one is representing truthfully. The subsequent qualification merely serves to show that the primary statement is false and the result is not truthful information but confusion. The advertiser who does not tell the whole truth when he starts to tell any of it is just that much worse than the man who tells none of it but who falsifies entirely. A dangerous counterfeit is one that closely approaches the appearance of the reality and the element of truth in an advertisement which also suppresses a necessary part of the truth or includes that which is not true, makes it more dangerous than a representation which is wholly false. Not only must a representation be true but none of the truth may be suppressed, if telling part of the truth is apt to mislead.

"But is there not some responsibility on the part of the buyer? Of course there is. There is the very old rule that the buyer must look out for himself that is, if the seller does not inject his own views and representations into the bargain. If the seller wants the buyer to use his own judgment and discover the truth for himself, then the seller must not make representations concerning his wares. If the seller attempts to influence the mind of the buyer by argument about his goods, then he must represent truthfully because the buyer can rely on such representation to be true. If a seller does not want to be under the burden of representing the truth, the whole truth and nothing but the truth, then let him keep out of the field of representation and stick to brands and labels of identification and origin.

"Reasoning from these principles the rest is simple. Artificial silk, no matter how it is produced, is always as compared with the natural, artificial. If it has merits they are the merits which belong to artificial silk. 'Art Silk' and all the rest of the futile efforts to make the false seem true are utterly unworthy. An artificial silk stocking, an artificial silk boot stocking, an artificial silk and cotton stocking, an artificial silk and wool stocking, each has its place, its market, but it must have them on its own merits, not because it can be made to look like something else. Use their right names and the merits which properly belong to them will be recognized. Call them by false names and they are judged by the user, not for what they are but for what they are not. There is no surer way to destroy a market for a product than to lead the buyer to believe it is something else, for he immediately compares it in use with his idea of that other article which has been suggested to him and it fails, not because it has no merits of its own but because it does not have other merits which belong to something quite different. Apples are a good fruit as apples but they are no good as oranges. There is a merit in a combination of wool and cotton in underwear which has been almost lost to sight because of the effort to sell them as 'all wool.' What has happened is just what might have been expected. The insistence on all wool has created the belief that there is a virtue in an all wool garment which a wool and cotton shirt cannot possess. With this idea in mind the public has demanded all wool underclothes, blankets, shirts, etc. The wool and cotton garment has had to pass not on its own merits but on those supposedly attached to all wool. Just as soon as the buyer is satisfied that the qualities, the merits which he wants, are those which are found in an honestly balanced wool and cotton garment and a wool and cotton garment is offered him, he will take it, not because of the merits of an all wool garment, but because of the merits which are in wool and cotton mixture.

"I hope I have made this clear to you because it is fundamental. When a product departs from the true significance of its name or representation, there is no limit upon the extent of the departure. If ten per cent cotton is 'all wool' why not twenty per cent? Why not forty, sixty, eighty, ninety per cent? Until we reach the point where the sole justification for the use of the word 'wool,' the sole relationship to truth, is the appearance of the nap on a cotton blanket. The standard breaks down and quality depreciates with it until the standard becomes meaningless. If one half as much money had been spent in establishing the merits of a wool and cotton mixture as has been used in selling wool and cotton as all wool, the underwear business would have been clear of many difficulties which confront it today including a Truth in Fabrics bill.

"The possibilities of the subject are so great that they can be dealt with at much greater length than your time or your patience will permit. If I have helped you to see the fundamental need for the use of trust, that trust relies on truth and is betrayed only by falsehood, you will have a clearer understanding of a principle which is capable of infinite expansion and application to the least detail. If I have helped you to this, then I have helped you to see that truth begets trust and that gain, success to be stable and enduring must be based on truth for its opposite, falsehood, entails loss. And so the whole problem of brands and labels and advertisements rises out of the realm of regulation by some outside agency and appears as it really is, a part of life, an act of living on the part of the individual whose true success here and now is determined by his fidelity to truth as it is known and becomes known, in his assumed relationships with his fellow men."

Following Mr. Gaskill's remarks, President Zens expressed to him, on behalf of the Association, that body's appreciation for the efforts of the Federal Trade Commission in its work of eliminating unfair practices, etc., and in turn Mr. Gaskill spoke the thanks of the Commission for the hearty cooperation received from the Association in its activities in this direction.

The final address of the Wednesday morning session was considered by many as one of the most interesting papers presented at an Association convention in many years. This was the talk of John Wyckoff Mettler, president of the Interwoven Stocking Company of New Brunswick, N. J. Mr. Mettler's subject was "Problems of Selling to the Retailer," and his remarks presented a number of most thoughtful and important suggestions gained from an extended experience in this field, in which his company has achieved preeminence.

Two Mills a Week

Since the 1922 American Textile Directory] of the Knitting Trades was issued there have been 58 new knitting establishments, many of them in the South. The average has been two mills a week.

To these newcomers in the industry, the William Whitman Company, Inc., extends its good wishes, and places at their service its ample and highly organized facilities for furnishing cotton, worsted, and worsted merino yarns.

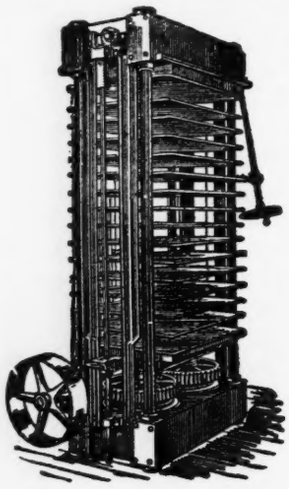
WILLIAM WHITMAN COMPANY, INC.

BOSTON NEW YORK PHILADELPHIA CHICAGO
AMSTERDAM, N. Y. CHARLOTTE, N. C., (after July 1)

SOLE AGENTS FOR THE YARN MILLS BELOW:

ACADIA MILLS,	LAWRENCE, MASS.	MARY LOUISE MILLS,	COWPENS, S. C.
MONOMAC SPINNING CO.,	LAWRENCE, MASS.	CENTRAL MILLS,	SYLACAUGA, ALA.
MANOMET MILLS,	NEW BEDFORD, MASS.	CATHERINE MILLS,	SYLACAUGA, ALA.
NONQUITT SPINNING CO.,	NEW BEDFORD, MASS.	SYCAMORE MILLS,	SYCAMORE, ALA.
TALLAPOOSA MILLS,	TALLAPOOSA, GA.		

ICEMORLEE COTTON MILLS. CO., INC., MONROE, N. C. DIXIE COTTON MILL CO., MOORESVILLE, N. C.



RELIANCE

Hot Plate Screw Press

FOR

Hosiery and Underwear

Write for Catalog and Prices

Reliance Machine Works

FRANKFORD, PHILA.

JOSEPH T. PEARSON & SONS CO.

MANUFACTURERS OF

BONE DRY
HOSIERY FINISHING BOARDS

THAT WORK ABSOLUTELY SMOOTH

PROMPT SERVICE—RIGHT PRICES

1815 E. Boston Avenue, Philadelphia

GENERAL MACHINE WORKS

YORK, PA.

Manufacturers of

Circular Rib Knitting Machinery

Cylinders and Dials

Mr. Mettler's Address.

Discussing this interesting subject, Mr. Mettler said in part:

"Quite a number of manufacturers selling to the jobber have attempted to sell directly to the retailer. For one reason or another many of these attempts have been unsuccessful. They have involved large financial loss. It is the feeling of the officers of your Association that these attempts have failed largely because those seeking to make the change have not fully understood in advance just what was involved, and that if these manufacturers had known more about the problem before hand they would have either met it successfully or never have attempted it at all. It is for this reason that I have been asked to prepare this discourse on the subject of selling directly to the retailer, in the hope that it may place before you in simple direct form the fundamental essentials of direct selling, so that any who may be considering this method of distribution may have before them a fair picture of the problems with which they must expect to deal.

"I will not bore you with any long-winded or high-sounding academic roll. I will attempt to present only practical suggestions based on actual experience, covering some of those simple pitfalls often regarded as insignificant and of little consequence but which really determine the outcome. Remember, it's trifles that go to make up perfection—but perfection is no trifle. Of course any manufacturer who has been through all this and is familiar with the problem of selling the retailer is already well fed up on this subject. He is like the sailor who is so sea-sick that he is sick of seeing the sea.

"When a manufacturer turns from selling the jobber to selling the retailer he steps into an entirely new business. Unless he knows pretty well what he is about before he undertakes it he will find it a step from daylight into darkness.

"Manufacturing is entirely different from merchandising, and merchandising is a far step from manufacturing. Many things perfectly acceptable to the jobber would never be tolerated for one minute by the retailer.

"Do not allow yourself to be misled by the finished accomplishment of some one outstanding success by overlooking the many years of struggle underlying a slowly developed growth. The old saying is certainly true in this game—'It takes years to grow rich overnight.'

"No proper consideration of this subject can be had without a fair understanding of the requirements of the retailer for the successful conduct of his business. This is simply getting the other fellow's point of view. It sounds easy, but you can't hope to think in terms of the retailer unless you learn to know something of how a store is run.

What the Retailer Wants.

"The retailer who knows what he is about is going to handle:

"(1) The line which has the greatest turn-over, that is, which is in greatest demand, which has the greatest consumer acceptance, the line which is most satisfactory to his trade.

"(2) The line which he can secure with ease and certainty, insuring continuity of supply, and

"(3) The line which shows him a satisfactory margin of profit.

"These are the three fundamental essentials. You cannot leave out any of them.

"Taking up the first of these—turnover—80 to 90 per cent of the retailer's business is done on a very few numbers, requiring very small stock considering the turn-over. The other 20 per cent of his business is spread over a great number of styles requiring a comparatively large investment in slowly moving stock. 'The retailer's profit is in turn-overs and not in left-overs'. I sometimes wish the retailer would always remember this himself.

"Mark-down and inventory shortage constitute the two great sources of loss to the retailer. The rate of the dealer's turn-over and his loss on 'mark-downs' really control his margin of profit and his overhead. Mark-downs which do not carry their share of the overhead involve dead loss in themselves and cut down the profit on the good lines. In some lines the retailer's mark-down runs as high as 20 per cent. This kills profit faster than anything excepting actual inventory shortage through stealing of stock by clerks or shoplifters.

"The dealer's 'turn-over' depends upon his getting goods that sell.

"The manufacturer who will deal with the retailer must make a wide enough range of styles to fully cover the active business of the merchant he seeks to supply. He must remember that it is the retailer and not himself who really determines what must be manufactured. He must stand ready to install or abandon machinery, regardless of cost, in order to make what the dealer requires. His turn-over depends upon his getting the right goods. In other words, you've got to make what the trade wants, and 'if the trade wants all bitch pups you have got to breed all bitch pups.' You needn't get the exalted idea that the retailer is such a fool as to be willing to buy all the easy-to-make styles from you and all of the hard ones from your competitor.

"Under the second retailer requirement I mentioned—ease and continuity of supply—you have to bear in mind that the retailer is not going to induce all of his consumer customers to buy any line of merchandise—no matter how good it may be—that he is not going to be able to get right along without interruption after he once introduces it, You can make up your mind before you start selling the retailer that you will have to maintain at all times an ample stock of finished goods instantly available for immediate shipment. This is easier said than done. Keeping a stock of a couple hundred styles, each of them in seven sizes, all in balance with demand in quantities and size assortment, with at least 75 per cent of your business on an immediate delivery basis, calls for an entirely different method of handling than making up goods against actual orders, as is customary in selling the jobber. Every time a retailer runs out of your goods you force him to put in some competitor's product. But that isn't the worst of it. The retailer jumps to the conclusion that you are supplying someone else with the goods that ought to be coming to him, and he thinks that every consumer who refuses to accept a substitute is going to a competing store to get what he asked for. If you make it difficult for the dealer to replenish his supply of your goods, in his disgust he is sure to follow the line of least resistance and to put in some other make that he can get with ease and certainty. All this involves the manufacturer in 'carrying the bag.' This he must be prepared to do. And this in turn requires large capital investment in finished

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NONQUITT SPINNING CO.,	NEW BEDFORD, MASS.	SYCAMORE MILLS.	SYCAMORE, ALA.
TALLAPOOSA MILLS,	TALLAPOOSA, GA.		
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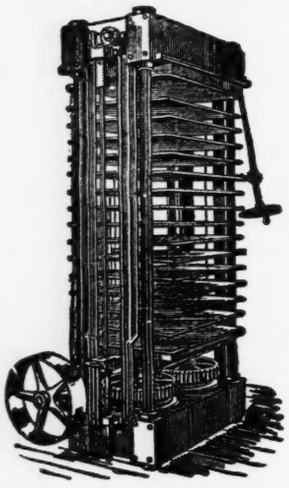

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Mr. Mettler's Address.

Discussing this interesting subject, Mr. Mettler said in part:

"Quite a number of manufacturers selling to the jobber have attempted to sell directly to the retailer. For one reason or another many of these attempts have been unsuccessful. They have involved large financial loss. It is the feeling of the officers of your Association that these attempts have failed largely because those seeking to make the change have not fully understood in advance just what was involved, and that if these manufacturers had known more about the problem before hand they would have either met it successfully or never have attempted it at all. It is for this reason that I have been asked to prepare this discourse on the subject of selling directly to the retailer, in the hope that it may place before you in simple direct form the fundamental essentials of direct selling, so that any who may be considering this method of distribution may have before them a fair picture of the problems with which they must expect to deal.

"I will not bore you with any long-winded or high-sounding academic roll. I will attempt to present only practical suggestions based on actual experience, covering some of those simple pitfalls often regarded as insignificant and of little consequence but which really determine the outcome. Remember, it's trifles that go to make up perfection—but perfection is no trifle. Of course any manufacturer who has been through all this and is familiar with the problem of selling the retailer is already well fed up on this subject. He is like the sailor who is so sea-sick that he is sick of seeing the sea.

"When a manufacturer turns from selling the jobber to selling the retailer he steps into an entirely new business. Unless he knows pretty well what he is about before he undertakes it he will find it a step from daylight into darkness.

"Manufacturing is entirely different from merchandising, and merchandising is a far step from manufacturing. Many things perfectly acceptable to the jobber would never be tolerated for one minute by the retailer.

"Do not allow yourself to be misled by the finished accomplishment of some one outstanding success by overlooking the many years of struggle underlying a slowly developed growth. The old saying is certainly true in this game—'It takes years to grow rich overnight.'

"No proper consideration of this subject can be had without a fair understanding of the requirements of the retailer for the successful conduct of his business. This is simply getting the other fellow's point of view. It sounds easy, but you can't hope to think in terms of the retailer unless you learn to know something of how a store is run.

WHAT THE RETAILER WANTS.

"The retailer who knows what he is about is going to handle:

"(1) The line which has the greatest turn-over, that is, which is in greatest demand, which has the greatest consumer acceptance, the line which is most satisfactory to his trade.

"(2) The line which he can secure with ease and certainty, insuring continuity of supply, and

"(3) The line which shows him a satisfactory margin of profit.

"These are the three fundamental essentials. You cannot leave out any of them.

"Taking up the first of these—turnover—80 to 90 per cent of the retailer's business is done on a very few numbers, requiring very small stock considering the turn-over. The other 20 per cent of his business is spread over a great number of styles requiring a comparatively large investment in slowly moving stock. 'The retailer's profit is in turn-overs and not in left-overs'. I sometimes wish the retailer would always remember this himself.

"Mark-down and inventory shortage constitute the two great sources of loss to the retailer. The rate of the dealer's turn-over and his loss on 'mark-downs' really control his margin of profit and his overhead. Mark-downs which do not carry their share of the overhead involve dead loss in themselves and cut down the profit on the good lines. In some lines the retailer's mark-down runs as high as 20 per cent. This kills profit faster than anything excepting actual inventory shortage through stealing of stock by clerks or shoplifters.

"The dealer's 'turn-over' depends upon his getting goods that sell.

"The manufacturer who will deal with the retailer must make a wide enough range of styles to fully cover the active business of the merchant he seeks to supply. He must remember that it is the retailer and not himself who really determines what must be manufactured. He must stand ready to install or abandon machinery, regardless of cost, in order to make what the dealer requires. His turn-over depends upon his getting the right goods. In other words, you've got to make what the trade wants, and 'if the trade wants all bitch pups you have got to breed all bitch pups.' You needn't get the exalted idea that the retailer is such a fool as to be willing to buy all the easy-to-make styles from you and all of the hard ones from your competitor.

"Under the second retailer requirement I mentioned—ease and continuity of supply—you have to bear in mind that the retailer is not going to induce all of his consumer customers to buy any line of merchandise—no matter how good it may be—that he is not going to be able to get right along without interruption after he once introduces it, You can make up your mind before you start selling the retailer that you will have to maintain at all times an ample stock of finished goods instantly available for immediate shipment. This is easier said than done. Keeping a stock of a couple hundred styles, each of them in seven sizes, all in balance with demand in quantities and size assortment, with at least 75 per cent of your business on an immediate delivery basis, calls for an entirely different method of handling than making up goods against actual orders, as is customary in selling the jobber. Every time a retailer runs out of your goods you force him to put in some competitor's product. But that isn't the worst of it. The retailer jumps to the conclusion that you are supplying someone else with the goods that ought to be coming to him, and he thinks that every consumer who refuses to accept a substitute is going to a competing store to get what he asked for. If you make it difficult for the dealer to replenish his supply of your goods, in his disgust he is sure to follow the line of least resistance and to put in some other make that he can get with ease and certainty. All this involves the manufacturer in 'carrying the bag.' This he must be prepared to do. And this in turn requires large capital investment in finished

goods and advance commitments for materials, involving the taking of all risk and loss incident to fluctuation in values—at times a financial factor of no small import.

"You may be successful in inducing a portion of the retail trade to place advance orders, provided there are advantages and no disadvantages to them in doing so. This means that you must expect cancellations on such orders and accept them gracefully. You must see to it that it is never to the disadvantage of a customer to place an advance order, and must not allow immediate delivery orders to jeopardize the shipment of advance orders.

"You cannot expect a dealer to handle your line unless you extend him sufficient credit to get enough of your goods to fully cover the requirements of his own trade after he has introduced your line to them. You must be prepared to extend credit even when it involves risk, to the extent of the customer's requirements.

"The third fundamental referred to is the dealer's margin of profit. This he will expect to be approximately 33⅓ per cent of his retail selling price, or a mark up of close to 50 per cent of cost. In some fast moving lines, where risk of mark-down left-overs is eliminated, the dealer can safely operate upon a somewhat smaller margin, but he will resent and resist any curtailment of his margin.

"All business is built upon confidence. If you shake the confidence of the dealer you are quite likely to shake him loose. You needn't think you will be able to hop your prices up and down according to changes in cost of production and have the retailer stick to you as a jobber would. The jobber understands changes in cost of production more readily than the retailer.

"So much for the retailer's requirements. We will now turn from the retailer and consider the meeting of his requirements by a manufacturer. Let us take, for example, a manufacturer with a fair size plant built up through the jobber with a fairly well established jobber trade. How is he going to turn to selling the retailer? How is he going to induce the retailer to take up a new and unknown line and how is he going to do it quickly, and what does this transaction involve? You have to bear in mind that the introduction of new lines is getting harder and harder. The virgin soil has been pretty well taken up and is being pretty carefully cultivated by the old-timers in the game and particularly by jobbers.

THINGS THE RETAILER MUST BE SHOWN.

"Why should any reputable merchant turn down a sure thing in an old established line, on which his consumers have been steadily repeating for years, for the purpose of taking a flier on an article of unproven demand, and how is the retailer to explain this change to his own consumers, who have been not only satisfied but pleased with what they have been getting, and what is to compensate him for the loss in prestige in giving up known lines for those unheard of and unproven? Experienced credit men will tell you the stores handling standard established lines are financially soundest.

"You will find that the retailer is experienced in trying out new lines and that he is well fed up on amateur adventures. Why should he change?

"At the outset the direct selling cost will overwhelm your profit—unless—your prices are ridiculously high. If you do succeed in opening accounts they must be properly served. It's a whole lot easier to open an account than to re-open it, and after you have been once around and mussed up the market you will find you are all done. The burnt child dreads the fire and the merchant has a long memory for the bungler. You can't get the confidence of a dealer quickly It takes years of trading to establish trade, but it only requires one or two misdeals to queer the game.

"The process of building up a large outlet through a very large number of small retail stores is necessarily a slow, orderly movement. Your goods will move from your factory warehouse just as fast as they sell over the retail counter and no faster. The idea of selling up your output in a few weeks doesn't apply at all in selling the retail trade.

"And so you will see the establishing of trade with the retailer by a manufacturer is a long slow process, the significance of which is the financial problem involved or the amount of capital you will be compelled to draw upon purely to meet the loss of the transition from the jobber to the retailer. I don't believe anyone can accurately estimate this advance. It is one of the greatest dangers incident to the change in selling policy under consideration, and at best it will take any large manufacturer years to build up sufficient demand through thousands of retailers to entirely take care of a fair-sized output. You must make large financial provision in advance to bridge this gap and you want to have the cash in the bank before you start.

"Entirely apart from the amount of capital needed to cover the dead loss of the transaction from jobber to retailer there are other problems in finance in connection with selling the dealer which may be larger than you would suppose. I have carefully estimated the capital requirements of selling as compared with manufacturing, and if you will divide an enterprise, manufacturing and selling to the retail dealer, into two departments, the first manufacturing and the second selling, and if you will allow the manufacturing end the capital that it requires for its manufacturing operations including its factory, land, building, machinery equipment, materials and supplies, goods in process and cash for the proper conduct of its business, and if you will allow all finished goods to pass into the hands of the selling department as fast as they are completely manufactured ready for shipment and allow the selling department its exact capital requirements for an adequate stock of finished goods, accounts receivable and only a comfortable cash balance, you will find, much to your surprise perhaps, that you will have a greater investment in your selling department than in your manufacturing department. I have watched this problem for years and it is correctly stated. I don't believe that the average manufacturer who has attempted to sell the retailer has fully understood this financial problem, and I think it has been more responsible for the failures that have taken place than any other one factor.

SOME OF THE PROBLEMS OF SELLING.

"I will touch briefly upon some of the problems of selling administration. The manufacturer who has been selling to the jobber would be appalled at the extent of detail in accounting and particularly in correspondence incident to selling a large number of comparatively small retail stores. Your organization layout for direct retailer selling will be very different from that for selling the jobber. You will have nearly ten per cent as many people in your office and sales force as in the entire factory force. You will find this will make quite a difference with your fixed overhead if you should attempt to shut down. You can't lay off your

office and sales force as you can lay off factory workers.

"The impression which the retailer gets of the manufacturer will be largely based upon the way in which his communications with the house are handled, the manner in which credits and collections are administered and the trade aid he received from the Sales Department in helping him dispose of the goods he buys. Here is the true test of merchandising. The line may be very satisfactory in every way and yet the reputation of the house may be anything but good. This depends largely upon promptness, courtesy and intelligence in all contact with the customer, whether it be by correspondence or through the direct appeal and assistance of the traveling salesman. Now, you may say this is obviously selfevident and any fool would know that much about it. But it must be borne in mind that the volume of correspondence in connection with sales, credits and collections becomes enormous and must be handled by a large number of clerks, some of whom can never get it into their heads that the customer is always right, or they don't see why the house should be "gypped" out of discount, or they don't understand why a customer should be allowed to return pre-war goods.

"Consider for a moment collection correspondence. Only a comparatively few of the smaller merchants pay their bills on the dot just as you would meet a note in the bank. Many of them pay as they themselves are paid by the consumers, and I ask you do you always pay your personal bills to the stores on a certain day, or do you do this when you happen to feel like it? Remember this is what the retailer is used to and quite naturally his point of view on this subject is influenced by his own experience. Very often when a retailer owes you past-due money, and receives a letter to remind him of the fact, he gets sore the very moment he sees your name on the outside of the envelope before he even opens it. He knows its a 'dun' for a past-due bill and no matter how politely it is worded it gives offense. That's enough to give you an idea of the delicate handling required for this work if you are going to avoid making a lot of loyal friends sore.

"Correspondence of this nature, in the best of hands, is difficult to handle, though vitally necessary in the conduct of business. To allow one group of retailers to take the maximum discount in paying bills at any old time is grossly unfair to those who pay on the dot for the same goods and is obviously contrary to sound business policy, and yet, to show you the other extreme, I have heard it said that the Credit Department of a reputable house recently put Marshall Field & Company on a cash basis because they had not met an invoice according to its terms, which, it turned out, had gone astray. Thus probably didn't worry Marshall Field and Company, but it shows what can happen to the best of them under decentralization of authority in business management. These clerks are very liable to get too close up in their point of view. There's such a thing as not being able to see the woods for the trees.

YOUR DAY IN THE SPOTLIGHT.

"The nearer you get to the center of the stage the easier you find it to open good accounts—but—don't forget the nearer you get to the center of the stage the closer you get to being the bull's eye on the target. If you are reasonably successful in establishing relations with the retail dealer, your merchandise, your trade marks and your methods will be closely copied and sometimes in an unscrupulous manner. Trade mark infringement cases follow naturally in the wake of every nationally advertised product. You would be amused and surprised at the nerve of some of the imitators. When the interwoven trade name was adopted, nearly twenty years ago, there was no "Inters" and there were no "Wovens" as hosiery trade marks. We went out of our way to steer clear of the field, and yet, a few years ago there suddenly began to spring up all sorts of "Inters' and all sorts of "Wovens" all obviously for the preconceived purpose of appropriating the hard earned reputation and consumer demand of Interwoven. Some even copied the design patented shape of the ticket and the color scheme, as well as part of the trade mark. It reminds me of the sign which hung in a famous Scotch golf club—'Members will please not pick up lost balls until they stop rolling.' We have had to prosecute a great many of these trade mark cases. We have always been successful but we have always had to pay the bill. If you ever have to pick out a trade mark, be sure you get one that no one can imitate. It will be valuable—when you find it.

"There are many matters of policy which cannot be discussed in the time allowed. Just this word of advice: Honesty is by long odds the best policy. Never change the quality of a style unless you change the style number. Never give inside prices, special discounts, advertising allowances or favors to favorites at the expense of all the rest. Good business admits of no 'monkey' business. Equal fairness to all is the only safe foundation for long life in trade. The good will of the retailer costs much time and money to secure. It must be carefully guarded.

"I have now shown you, selected at random, many of the practical little problems involved in selling directly to the retailer. To have an established outlet through ten thousand loyal and contented retail stores and to have millions of satisfied customers as users of your product, and second to none, is a worthwhile accomplishment—well worth the many years it takes and the millions of dollars it costs. And yet it requires almost as much care and management to maintain this sort of a layout as it takes to establish it. If, in operating under this system, you fall down on either the goods or the service, you will still lose out in the end.

"The most profitable hosiery mills in this country distribute through the jobber. This is a fact which we cannot dispute. There are advantages in favor of each of the two systems but it is my firm conviction that either may be equally successful.

"Every time I hear of a manufacturer throwing up good jobber connections to try selling the retailer I have to think of the epitaph on the tombstone: 'I was Well; I Wanted to be Better; I Took Physic and Here I Am.'

"After twenty years of careful study of the problem of selling, I have come to have a very high regard for the jobber. The manufacturer's agent, the commission house and the jobber all have their proper places in the distribution of merchandise. Many of the hosiery jobbing houses are highly developed and well run. One occasionally hears idle talk concerning the elimination of the jobber. Just at present he is a long way from eliminated. The hardest competition we have comes from the jobber. In my opinion he is not going to be eliminated in the hosiery field.

"Many manufacturers have turned back to the jobber after unsuccessful attempts to sell the retailer. Only a handful have survived the pitfalls of the transition. We

consider ourselves most fortunate in having survived. I have no doubt that some of you, who have been listening to this rambling discussion, have been trying to figure out how in the world we did survive and you may have been looking for some one good reason why. So, now, if you will give me your closest attention, I will tell you *the one big secret* of the Interwoven success—we have always had damn good luck."

The Second Session.

Election of officers for the coming year and the discussion of an educational campaign for more intelligent buying on the part of jobbers and retailers, an address by F. L. Miller, Jr., president of the United Hosiery Mills Corporation, Chattanooga, Tenn., on "The Future of Seamless Hosiery" and a paper on "Artificial Silk and Its Growing Importance to the Hosiery Industry," by Samuel A. Salvage, president of The Viscose Company, Marcus Hook, Pa., featured the Thursday morning session, which concluded the convention.

All officers were re-elected for another term, these being: President, Joseph H. Zens, of the Milwaukee Hosiery Co., Milwaukee, Wis.; first vice president, Gustave Oberlaender, of the Berkshire Knitting Mills, Reading, Pa.; second vice president, W. H. McLellan, of Alden Mills, New Orleans; treasurer, Ernest Blood, of True Shape Hosiery Co., Philadelphia; directors: Thomas W. Buck, of Thomas W. Buck Hosiery Co., Philadelphia; G. F. Dickson, of Minneapolis Knitting Works, Minneapolis; D. L. Galbraith, of American Textiles, Inc., Bay City, Mich.; John W. Mettler, of Interwoven Stocking Co., New Brunswick, N. J.; F. L. Miller, of United Hosiery Mills, Chattanooga; W. Park Moore, of Hancock Knitting Mills, Philadelphia; W. W. Moyer, of Euphrata, Pa.; and J. W. Lesher, of Unrivaled Hosiery Mills, Inc., Williamsport, Pa.

The first address on the Thursday morning program was the discussion of artificial silk by Mr. Salvage. Mr. Salvage illustrated his remarks with charts on the production and consumption of artificial silk, etc., and his address was received as most informative by the members present. He said in part:

"Artificial silk dates back to the year 1884 when a Frenchman—Count Chardonnet—was granted a patent for a process for making an artificial silk thread from nitro-cellulose, or what is commonly known as gun cotton. This fact has led up to a complete revolution in silk textile manufacture, and by the remarkable strides that have been accomplished in perfecting its manufacture, artificial silk today occupies an important position in the commercial world.

"Since that time other processes have been invented and perfected, and today there are four processes in use for the manufacture of artificial silk on a commercial scale.

"The first is the Chardonnet process which uses cotton as a base. It is treated with acids and ether which dissolve the cotton and form a nitro-cellulose solution.

"The next process which came into use was the cupro-ammonium, and it was most extensively developed by the Germans. This process also used cotton as a base and pure copper and ammonia for dissolving the cellulose. The yarn produced by this process was regarded as an improvement over the yarn produced by the Chardonnet process, but at that time artificial silk yarn had greater limitations than today, and for this reason, was only used in commercial quantities by the braid and millinery interests.

"The next development of importance is the Viscose process. Viscose was discovered by two English chemists, Cross and Bevan. It is a cellulose solution, and the word 'Viscose' means a sticky substance. Artificial silk made from Viscose was discovered by an Englishman named Stearn. He made a product with a presentable appearance but only on a laboratory scale and he finally disposed of his patents. These patents were developed in both England and the United States at about the same time and along the same lines, starting in about 1902. A very large amount of capital was expended in both countries before a method was found to produce Viscose artificial silk of a quality acceptable to the trade on a profitable basis; and it was as late as 1911 when the first important plant was completed in this country to produce artificial silk on a sizeable commercial scale.

"This plant produced 320,120 pounds in 1911, and increased its production to 1,120,000 pounds in 1912.

"England developed faster than we did here, as in 1906, she had erected a plant which was producing a good product on a large scale, which was strong and soft and found adaptable for many textile lines.

"The last development is the so-called acidate process, which has not yet reached the proportions of the three mentioned previously.

"I regard the American manufacturer as the most enterprising one in the world when it comes to meeting new conditions, or rather, when endeavoring to adapt himself to a new product, and I think my opinion is borne out by the fact that the American hosiery manufacturer was the first to consume quantities of artificial silk for hosiery. This development started in 1911, and has steadily grown into a business of large magnitude." Mr. Salvage at this point exhibited a chart which showed the tremendous expansion in the home production of artificial silk during the past ten years. In 1913, the domestic production increased to over one and one-half million pounds. In 1914 to nearly two and one-half million pounds, and in 1915 to over four million pounds. In 1916 to practically five and three-quarter million, and in 1917 to nearly six and three-quarter million pounds. 1918 is the only year in which the production did not show an increase, and this was entirely due to the war. The artificial silk industry was not essential to winning the war, said Mr. Salvage, and consequently it was impossible to run the plants to full capacity, with the result that in 1918 the production fell to 5,828,000 pounds. In 1919, which was after the armistice had been signed, the production increased to 8,174,000 pounds. In 1920 it rose to approximately ten and one-quarter million, in 1921 to fifteen million and in 1922 to twenty-three and one-half million.

This chart also showed the importations of artificial silk, showing the importations of this in 1922 to be the largest in history, with current statistics indicating a further increase.

The next chart presented covered a comparison of the importation of raw silk and the consumption in this country of artificial silk, the latter being arrived at by combining the domestic production and importations. This showed a raw silk importation in 1922 of between 45,000,000 and 50,000,000 pounds, as against a fiber silk consumption in the same year of about 27,000,000 pounds, the increase in this consumption having risen steadily since 1913, with the ex-

ception of the years 1917 and 1918, from a consumption of 4,000,000 pounds in that year.

Approximate figures on the consumption of fiber silk in the United States, as given in Mr. Salvage's charts, are: 1913, about 4,000,000 pounds; 1916, nearly 8,000,000 pounds; 1918, about 6,000,000 pounds; 1919, about 9½ million pounds; 1920, about 12,000,000 pounds; 1921, about 15,000,000 pounds; 1922, about 27,000,000 pounds.

Commenting upon this, Mr. Salvage, said: "You will observe the marked increase of consumption in artificial silk during the past four years, and the only decline in consumption in the years 1917 and 1918 was brought about by world conditions which existed at that time. Even during the dreaded year 1920—which the business man may well shudder to think of—you will note that the consumption of artificial silk increased." This was in spite of an opposite effect on the real silk market, he pointed out.

Mr. Salvage's next chart compared the hosiery consumption of fiber silk in the United States with the total consumption in this country, showing the former to be about as follows: 1913, approximately 1,500,000 pounds; 1914, tbout 2,500,000 pounds; 1915, about 4,500,000 pounds; 1916, about 4,250,000 pounds; 1918, about 2,250,000 pounds; 1919, about 2,500,000; 1920, about 3,000,000; 1921, about 4,500,000 pounds; 1922 about 6,750,000 pounds.

Also exhibited was a chart showing the knit goods consumption, excluding that of hosiery, which showed that this consumption practically only started in 1922, the consumption increasing about 4,750,000 pounds in the past two years.

Total knitting machine consumption of artificial silk, of course including hosiery, was next exhibited, showing a consumption by knitting machines ranging from about 1,750,000 pounds in 1913 to approximately 13,250,000 pounds in 1922.

The next chart, showing weaving consumption of fiber silk, showed that in this industry approximately 7,500,000 pounds of artificial silk were used, compared with a consumption of about 1,750,000 in 1913.

Charts showing exports of fiber silk hosiery were also included by Mr. Salvage, of which the following recapitulation is given:

Year	Dozen Pairs	Value
1918	632,000	$2,800,000
1919	1,594,000	8,790,000
1920	807,000	6,900,000
1921	670,000	2,980,000
1922	1,660,000	.....

Mr. Salvage's final chart showed the price range of raw silk as compared with that of artificial silk over the past ten years, in connection with which he pointed out that "while raw silk has zigzagged considerably over this period, artificial silk has had only one downward movement in the past ten years, which was confined to six consecutive months —the time of the awful crash."

Taking up again the growing importance of the industry, Mr. Salvage continued:

"I want to first attempt to impress upon your minds what the increasing development of the artificial silk industry the world over has amounted to. I have no records at hand of the world's production of artificial silk in the year 1913, and, therefore, I cannot offer a comparison of it to the real silk production during the same year; but it is safe to assume the artificial silk production was very much smaller and hardly comparable; I have, however, collected estimates of the world's annual production of artificial silk as of December 31, 1922, and I offer them to you, without vouching for their accuracy, but having obtained them from the best source available.

	United States	23,500,000 pounds
	England	15,340,000 pounds
(1)	Germany	12,584,000 pounds
	Belgium	6,292,000 pounds
	France	6,292,000 pounds
	Holland	2,516,800 pounds
	Switzerland	1,887,600 pounds
	Austria	1,573,000 pounds
	Hungary	1,887,600 pounds
	Poland	943,800 pounds
	Czeko-Slovakia	6,292,000 pounds
(2)	Italy	6,292,000 pounds
(3)	Spain	.....
		79,738,000 pounds

(1) This is capacity of production; actual production less pro tem.

(2) This is a rough estimate, but likely to be exceeded soon.

(3) Unimportant.

"I saw in a recent issue of the New York Commercial a statement that the world's artificial silk output for the year 1922 was 71,900,000 pounds; which more or less confirms the figures I have submitted, as they show the productive capacity at the close of the year. The world's production of real silk for the year ending June 30, 1922, is stated by the Silk Association of America to be 59,437,000 pounds; and therefore you will note that the world's production of artificial silk has already exceeded that of real silk.

"I think there are two points I would like to emphasize to show the growing importance of artificial silk to the hosiery industry. The first being the determination of the interests in the artificial silk industry to constantly and materially increase their production, if the demand justifies such action. There are huge extensions to plants here already on the way, and it is estimated that the production in this country for 1923 will exceed 1922's production by about 7,500,000 pounds and plans are already laid down which will assure the 1924 production of a similar increase over 1923.

"You may be aware that the Philadelphia district has the largest artificial silk plant in the world. I refer to The Viscose Company's plant at Marcus Hook, Pa., and you may be interested to know that this company has already purchased land for the erection of another large plant which we are going to build within the city limits of Philadelphia.

"I might state that it has been, and will continue to be, the policy of the company I represent, to increase its production up to a point just short of saturation in order to endeavor to bring about a steady price range and avoid if possible speculation, which only produces spectacular or volcanic eruptions in prices. We believe that the industry can best be developed by a steady price which will give assurance to the consumer.

"The second point is that the hosiery industry started consuming artificial silk by plaiting it on cotton, and this led to knitting large quantities in straight artificial silk hose. While I am informed this is a permanent develop-

ment, I myself am not prepared to say; but I feel it is quite safe to say that twisting artificial silk with real silk and knitting it into hose is a permanent development, and while this has been done for a number of years, it is only quite recently that this has developed into substantial quantities, and it may be regarded that this development is still more or less in its infancy, and is going to grow into a business of much greater proportions. We find today old established hosiery firms who have not heretofore used artificial silk now putting out a line of this sort, and from every angle we view this, it would seem that this development is going to be of greatest importance to both industries in the future.

"Very large quantities of artificial silk have been and are now being used for twisting with wool for hosiery, but I cannot say how permanent this will be. The full fashioned hosiery interests have really only recently used artificial silk, and we now find the demand from this source increasing, and we anticipate a very large demand from it in the future.

"There is another point on which the subject I was asked to speak does not embrace, but perhaps I may be allowed to mention it, as I think the artificial silk industry regards it as highly important, and as your association covers both the hosiery and underwear interests, it is perhaps appropriate for me to do so. The underwear manufacturers, up to the present, have not been large consumers of artificial silk, but a few who have considered the product seriously for their goods have consumed constantly increasing quantities; and I feel we are on the eve of a period when artificial silk will be used very extensively in connection with underwear, and the day will come when there will be a most important relationship between this branch of your association's interests and the artificial silk industry."

The final address of the session was made by Frank L. Miller, Jr., president of the United Hosiery Mills Corporation, Chattanooga, Tennessee, on the subject:

The Future of Seamless Hosiery.

"When we think of seamless hosiery and ask this question, we really refer to women's silk hosiery. We cannot possibly refer to women's seamless silk hosiery, because such phrascology is a misnomer. There is not extant today such a thing as women's seamless silk hose. I, myself, have not seen a pair of women's seamless silk stockings in several years. There are, of course, classes of seamless hosiery—men's and children's in cotton and silk, and something of my discussion is relative to them—but I do not hesitate to say there would be no discussion—there would be no question to discuss—except for the problems connected with women's silk hosiery knit on circular machines, afterward seamed and sold in competition with their more expensive full-fashioned sisters.

"There can be no question as to the established position of men's seamless socks. There can be no question as to the established superiority of children's seamless stockings, socks and three-quarter lengths for every age and at every price.

"In women's cotton and mercerized goods, there is no question as to seamless supremacy, because of manufacturing economy. You would be surprised to know the tremendous sale of women's cotton hosiery in the country. In our mills around Chattanooga, in the year 1922, there were manufactured of three styles of women's cotton hosiery 193,000 dozens—of all styles of women's cotton hosiery, a full quarter of a million dozens, and this is only one corporation.

"We can easily dispose of the question of children's hosiery, because largely they are seamless. There are many interesting phases, however, of children's manufactured. The expertness of ribbing (setting the dial properly to get elasticity and plumpness of fabric); the differing qualities of raw materials used, making one stocking quite different in the finished product from another. Of late, much care and thought have been given to beautiful transferring and looping, eliminating all ugly bulges. Again, there is a growing tendency to spend more money in dyeing, finishing and packing than ever before, so that today those mills who give most attention to these details find their product sells easier and quicker, even if the price is somewhat higher than that of competitors.

"The most noticeable tendency of the times in children's goods, as in all other types of merchandise, is towards the finer gauges. We have today countless mills running 320 and 340 needle ribs, and one or two manufacturing 360 needle stockings. There has been a great increase in the use of finer silk socks and silk ribbed stockings for children, a half dozen seasonal colors lending beauty to this type of goods.

"Again, in men's hosiery, the seamless silk half hose has made serious inroads into the full fashioned business, the latest improvement found in the split foot Banner half hose, manufactured almost entirely in the finer gauges—this improved article is perhaps the easiest selling hose on the market. The seamless cotton socks command the field.

"So it is with women's cotton goods; again we find finer gauges, carefully made seams and triple seams; attention to the diameter of the machines to afford narrower ankles and better fitting stockings. In women's cotton hosiery, the inexpensiveness of manufacture, particularly in the South, is noteworthy. Both in women's goods and half hose, particular care is being given to increase fineness of gauge and more precise manufacture of each individual size. In men's hosiery, many mills are using three different diameters to make the various sizes, and in women's hosiery, two different diameters.

"It is not surprising, then, on a cheap silk market, to see in silk hosiery the women's dollar stocking, carefully made with a seam and triple seams, manufactured either on the latest spring needle machine, or upon the latest Scott & Williams machines with special cams, which include clearness of fabric. On a high silk market, many mills have been producing twisted silk with fiber, to obtain added weight, together with beauty and durability. Either of these stockings may be economically and profitably manufactured to sell over the counter in their respective seasons. In this field, there is not the slightest question of the superior kind of hosiery formerly known as "Women's Seamless Hosiery."

"By process of elimination, we have thus narrowed the discussion down to one topic: The question of silk hosiery at prices higher than $1.00 per pair retail as a field for the seamless manufacturer. It is generally contended that above this price the consuming public insists upon strictly full fashioned goods. It is natural at this time that there should be a discussion. It is because of the apparent slowness of demand for women's silk hosiery, knit on seamless machine and afterwards seamed. There is, indeed, everything favoring full-fashioned merchandise in the higher prices: An

age long superiority which can be overcome, not by facts alone. Facts must be supplemented with much talk, carefully-planned advertising—and then, more facts. These facts are roughly classified:

"(1) Durability: There is little argument that a 12-strand seamless women's stocking to sell for $1.50 per pair over the counter is highly durable, just as all other seamless stockings wear better, in my opinion, than full fashioned stockings.

"(2) Constantly improved quality: Since prior to the war, many things have happened in seamless hosiery. I often think that the little seaming attachments we bought in 1914 in our institution, putting a seam down the back of a cheap, club-footed 15-inch boot Japan silk women's stocking made on a 3¾-inch machine, to sell at 50 cents per pair—I say, I often think that the seam we put down the back in imitation of our more ornamental full-fashioned sister, was the inspiration for better merchandise. Since then we find new sinkers and cams, or the growing use of the spring-beard needle. Either produces a fineness and clearness of fabric, we think, equal to most full-fashioned stockings. Since then, the narrowed ankles; some clumsily produced, others more delicately attained, through the use of the narrower diameter. Since that time we find seamless stockings with these narrow ankles being produced in high boots on fine gauge machines. The growth, first, of 240 needle and then of 260 and 280 needle machines, narrowing the gap in fineness of gauge between the seamless and the full-fashioned types of hosiery. Remember, that gauge really means needles to the inch. The number of needles a stocking possesses is unimportant, unless you also know the diameter of the machine. If a machine be 3¼-inch diameter, it produces approximately 10 per cent finer stocking than the same machine with the same number of needles in 3½-inch cylinder.

"In summary, I feel that seamless hosiery is established in every field, that its future is assured with the exception of higher priced women's stockings, and in this field. I want to definitely assert that tremendous strides have been made, remarkable improvements effected in fabric, durability and finish—a magnificent result for a modest price.

To give an illustration, I was looking through an old file and found a women's silk stocking produced by our mill nine years ago. I compared this with today's product—I need no further evidence. Again I say, that such improvements have been made that I feel in a few years more the seamless stocking, as such, in any price field that is chosen, will begin to gain that definite call, that positive demand over the retail counter that the full-fashioned stocking has always commanded.

"When the stocking reaches that degree of perfection that its manufacturer can definitely assert—Our stocking is manufactured on a circular machine, and as such, is offered to the consuming public because of its superior merit to any other kind of merchandise—then I think the future of seamless higher priced hosiery may begin to be felt, but so long as the name 'seamless' is retained, that name itself is the greatest of all handicaps. It is a misnomer, the goods are not seamless, but are seamed. There is no such thing in the United States as a women's 'seamless' silk stocking. If the seamless manufacturer is to make the higher quality of his product generally known, he must throw aside a name which he has outgrown."

At the conclusion of Mr. Miller's paper, George F. Dickson, general superintendent of the Minneapolis (Minn.) Knitting Works, presented to the Association a plan "for educating buyers in the importance of adopting scientific efficient buying methods which will enable the knitter to plan the continuous operation of his mill and to buy yarns and other supplies to advantage, thus lowering production costs and encouraging greater stability."

Mr. Dickson was enthusiastic in the presentation of the plan, pointing out that "the time had come when manufacturers of knitted products should do something more than talk." He said that at present the mills buy yarns on a speculative basis, guessing at their needs, and further pointing out that continuous operation would eliminate high overhead that attends interrupted operations. Reduced prices to customers would also be a benefit, he pointed out, as the mills would be able to get prices down and deliver merchandise when wanted.

President Zens announced that the plan had been approved by the Association's board of directors, who had named B. W. Thayer, of the Minneapolis Knitting Works, as chairman of a committee to launch this movement, having also set aside funds for this purpose. It was also stated that the ecoperation of the other knitted material associations would be solicited, as well as the support of the Department of Commerce, bankers' associations, the U. S. Chamber of Commerce and other business organizations.

Annual Luncheon.

Superseding the former custom of an annual banquet, at this year's convention this was changed to a luncheon, which was held Thursday at 1 o'clock at the Bellevue-Stratford Hotel. The speaker of the occasion was Will Rogers, of Ziegfield Follies, who entertained the knitters with humorous quips concerning their business, also discussing current topics in the inimitable Will Rogers fashion. The Ziegfield Quintet furnished music for the occasion.

Full Fashioned Advertising Campaing.

An important feature in connection with the Association's convention was a meeting held on Tuesday afternoon by members of a group of full fashioned hosiery manufacturers who have contributed to the proposed national advertising campaign to the consumer, for the purpose of organizing to promulgate this much discussed campaign.

A committee was appointed to have charge of this campaign, the members of which are: John Botts, Harrington & Waring, New York; R. R. Snyder, Berkshire Knitting Mills, Reading, Pa.; T. H. Thieme, Wayne Knitting Mills, Fort Wayne, Indiana; R. Leavitt, Onyx Hosiery Co., New York; Ben Van Raalte, Van Raalte Co., New York; John Bromley, Jr., Quaker Hosiery Co., Philadelphia; Frederick Thun, Textile Machine Works, Reading, Pa.; and W. Park Moore, Hancock Knitting Mills, Philadelphia.

Further developments in the campaign were planned for the near future, a meeting to be held in New York City the following week, at which a chairman was to be selected and consideration given to an advertising agency to handle the campaign.

Members of the group, it was announced, will contribute five cents per dozen on full fashioned hosiery of silk and silk mixtures and two and one half cents per dozen on other full fashioned goods. It was decided at the meeting that the campaign shall be of not less than three years' duration and that a fund of $500,000 per year will be provided, making a total of $1,500,000 in all.

The Exhibition of Knitting Arts

More than one new standard in exhibition circles was set up at the Nineteenth Knitting Arts Exhibition, held at the Commercial Museum, Philadelphia, during the week of April 2 to 6. That the show was even better than its most successful predecessors was generally the opinion of those attending during the week, and the event developed into a most profitable occasion for exhibitors and visitors alike.

Naturally, much of the success of any exposition or show depends upon the preparatory arrangements made and executed by the management, and for this reason it is quite right that a large measure of the credit for this year's show goes to Chester I. Campbell, who as general manager gave the exhibition his personal supervision, and his able corps of assistants. Mr. Campbell conducted the 1922 exhibition with credit and the greatest satisfaction, yet he even exceeded this success with the show held last month.

In the matter of hall decoration, exhibit arrangement, courteous attention, and every other feature contributing to make a show pleasant and successful, it seemed no detail had been neglected.

The hall was profusely decorated with the national colors, green and white draperies and artificial plants. Spacious aisles, a symmetrical arrangement of the exhibit spaces and careful attention to the appearance of the hall were features that received much comment, as did the efficient service received at all times from the exhibition offices.

The individual exhibits themselves were another feature aiding in the success of the event. It would have been wellnigh impossible to stage such an affair to the best measure had not the exhibitors themselves showed a splendid spirit of cooperation with the management on every score.

An innovation introduced at this exposition was a hosiery style show, conceived by and conducted under the auspices of "The Hosiery Retailer," of Boston. On a stage erected at one end of the hall, some fourteen picked models exhibited the latest styles in hosiery. Among the exhibitors in this show were the following: Allen Hosiery Co., Philadelphia; Brown, Durell Company, Boston and New York; Rosenhain Co., Inc., New York; Van Raalte Co., New York; Providence (R. I.) Silk Hosiery Co.; Onyx Hosiery, Inc., New York; Nu-Style Fabrics Corp., New York; Northampton (Mass.) Silk Hosiery Co.; Miller Hosiery Co., New York; Kramer Bros., New York; Everwear Hosiery Co., Milwaukee; Corticelli Silk Co., Florence, Mass.; and the Cadet Knitting Co., Philadelphia.

Indicative of the activity of the National Association of Hosiery and Underwear Manufacturers was an extensive exhibit staged under the direction of the Fellowship on Research of the Association. This feature of the Association, which is being maintained in the textile division of the Bureau of Standards at Washington,, under E. M. Schencke, is working to the end of standardization on a number of phases of knitting mill operation which is calculated to result in an enormous saving to the industry, if effected.

Exhibited were samples of the standardization work being attempted by this branch of the Association. One of these is the standardization of paper packing boxes. Work on this has been practically completed, and is nearly ready for submission. Standardization of methods for measuring hosiery is another feature of the work of the Fellowship on Research, the recommendations on this having already been endorsed by the Bureau of Standards, the Textile Commission of the Federal Specifications Board, the American Home Economic Association, and the National Association of Hosiery and Underwear Manufacturers. Cone standardization is another project being developed by the Association.

With regard to the paper box standardization, it was stated that at the present a wide range of sizes and shapes of boxes are being used, the number of which it is hoped can be materially reduced for efficiency and economy in packing. In connection with the standardization of yarn cones, it was pointed out that standard cones will eliminate waste in manufacture.

Other projects proposed by the Fellowship are the standardization of twist required for all cotton yarns used for hosiery and underwear; standardization of mill equipment; standardization of methods for testing breaking strength, for which a special machine has been devised in the Bureau of Standards; standardization of breaking or bursting strengths for hosiery and underwear; standardization of nomenclature; standardization of lubricants for all knitting machines; the determining of the value of dyestuffs, chemicals and soaps used for hosiery, referring especially to tendering, fastness to light; chlorine, etc.; the standardization of knitting to quarter sizes; the standardization of sizes of yarn used for hosiery and underwear; the classification of hosiery and underwear and materials.

Descriptions of Representative Exhibits.

The show this year was marked by a wide variety of exhibits as to types of materials and equipment displayed, etc., and quite a number of new devices, attachments and improvements were being emphasized. Descriptions of some of the representative displays follow:

Aberfoyle Manufacturing Company, Chester, Pa., had no exhibit, but maintained their usual generous reception space for greeting friends and customers. The representatives of the company in attendance at this space during the week included: James Holt, James McCrudden, Charles Harding, F. W. Hancock, T. Golden, S. Rowcroft, and R. W. Yeabsley.

American Laundry Machinery Company, Cincinnati, Ohio, in their large space displayed the 36 x 64 American monel metal rotary dyeing machine for the dyeing of all shades on hosiery of all types; the 44-inch American knit fabric calender for finishing and setting of tubular cloth; the 48-inch, copper basket, motor on spindle Humatic extractor with positive safety door and automatic timer; the 54-inch American rotary hosiery press with new high finish apron; the 36 x 64 American monel metal lined, monel metal cylinder Acme hosiery dyeing machine for net dyeing; the steam driven American underwear finishing press for the re-finishing of garments after folding; the specially constructed dyeing machine with a glass end to demonstrate the performance of the Y-pocket principle and baffle plate. The company was represented by G. G. Rups, George L. Hoyer of the eastern division, H. G. Mayer and W. C. Dodson of the southern division, S. G. Dabner of the Canadian office and F. C. Miers, from the Cincinnati office.

American Scrubbing Equipment Company, of Hannibal, Missuri, were a new exhibitor at this year's show. Among

the models being exhibited and demonstrated were the No. 5 machine, with the 24-inch brush ring; No. 9, with 18-inch brush ring; No. 7, with 14-inch brush ring; No. 2 combination mop truck; No. 4, mop truck. The absence of the genial countenance of J. W. Farris, Jr., director of sales, was noted, but the company was ably represented by H. L. Jones, who has charge of the Philadelphia office.

American Yarn and Processing Company, spinners and mercerizers, Mount Holly, North Carolina, were represented in the reception space of their representatives, Forrest Brothers. J. M. Hatch, secretary and assistant treasurer, was present from Mount Holly. Samples of the 20s to 80s mercerized yarn produced in the plants of the company were shown, as were samples of the cotton fiber from the growing plant to the finished yarn. The Forrest brothers—Harry, Wyndel and Richard—were on hand also during the week.

Boger and Crawford, J and Venango Streets, Philadelphia, maintained their usual reception space with samples of yarn produced at their spinning plant at Lincolnton, N. C., and mercerized at their Philadelphia plant. Robert C. Boger and Alfred Crawford were present during the week.

Charles Bond Co., 617 Arch Street, Philadelphia, featured a 96-inch pulley operating on S K F ball bearings, being driven by a ¼-horsepower motor by means of a small string as a belt, illustrating the elimination in friction brought about by the use of ball bearings. This concern handles a number of lines of textile mill supplies, and were also demonstrating the "Grundy" flexible coupling, the U. S. Graphite Company products, "Boston" gears, and two products of the Flexible Steel Lacing Company, Chicago,—Alligator steel belt lacing, and Flexico-Lok lamp guards. "Bondaron" belting was also on display as were the casters manufactured by the Bond Machine and Foundry Company. H. R. MacFern represented the company at this exhibit, and C. L. Garesche was in attendance from the Flexible Steel Lacing Co. Roy Martin and Mr. Corrigan were also present.

George C. Decker, Philadelphia, representative of the Bradley Stencil Machine Co., demonstrated the new model round and long style Bradley stencil cutting machine equipped for ½, ¾, 1¼, and 1½ inch letters, for cutting cardboard stencils for marking all classes of shipments. The 1¼ and 1½ inch machines are used principally for export shipments. Also displayed were stencil filing cabinets, fountain stencil brushes and other improved equipment for the shipping department. Mr. Decker and E. H. Green and W. C. Weber were present.

H. Brinton Company, 3700 Kensington Avenue, Philadelphia, had one of the large operating exhibits, with five machines on display and in operation. These included a 15-inch, 8-feed, 14-cut body machine, a 5-inch golf hose, fancy top machine; 1¾-inch sinker top necktie machine; a 3¼-inch, 240-needle, French welt, rib top machine; a 3½-inch, 240-needle, hosiery knitter; and a 3¾-inch, 176-needle, fancy hose and half-hose machine, made by Wildt & Co., of Leicester, England. This machine is being handled in America by the H. Brinton Co. H. S. Horrocks, secretary-treasurer, William H. Allerton, L. H. Quinn and J. R. Forrest, were present from the H. Brinton Co.; and Mr. Wildt, of the English concern, was also present, accompanied by H. H. Holmes.

Clipper Belt Lacer Company, Grand Rapids, Michigan, featured belt lacing equipment. They emphasized the "Junior" lacer for small belts, and demonstrated with their lacing machines the "Clipper" belt fasteners. Carl P. Field, factory representative, and William F. Kall, service representative, were in attendance.

Cooper Hewitt Electric Company, with offices at 311 Drexel Building, Philadelphia, displayed their mercury vapor lamps for lighting textile mills. They were emphasizing the outstanding characteristics of the units as the restful green color of the light enabling sharp vision with no eyestrain, the lack of glare, and the absence of sharp shadows, together with high efficiency and low operating expense. The exhibit was in charge of H. G. Blauvelt of the Philadelphia office, and Leo Cohn of the Hoboken factory.

Dixie Mercerizing Company, Chattanooga, Tenn., displayed samples of 20s to 80s/2 yarn on skeins and cones, entertained visitors at their reception space. George B. Pfingst, Sr., George B. Pfingst, Jr., J. Blackwood Cameron, and F. Osborne Pfingst, of the selling agency, and T. H. McKinney, manager of the Chattanooga plant, were present.

Eclipse Textile Devices, Elmira, N. Y., had a number of interesting devices on display and in operation. One of these was the full set automatic stop motion, which stops the frame when the bobbin fills, making the spinning frame an automatic unit, this being the first public presentation of the device.

Another new device was the Campbell single bearing top roll for spinning frames. It was pointed out that this device will do away with two-thirds of the bearings used on the present type of roll, eliminating by this many places for oiling, and that the construction allows the centralizing of each end with the roving traverse motion. The "Eclipse" automatic yarn cleaner, with new paraffin attachment, was also exhibited in operation.

A most interesting feature of the Eclipse exhibit was the Van Ness hydraulic dye gun for random dyeing on yarn cones. This was devised by Henry Van Ness, superintendent of the Eclipse plant, and its purpose is spotting yarn on cones to give various mottled effects to knitted garments. The capacity of the machine is two pounds of yarn in three minutes, and a 400 pound pressure is exerted on the flow of the dye into the cone. A special arrangement for giving the required distribution of the dye on the cone is included. The machine attracted a great deal of attention, this being its first public showing.

J. C. Ferguson, W. Gary, L. W. Campbell, Peter Brown, and Mr. Van Ness were in attendance at this exhibit.

Fletcher Works, Glenwood Avenue and Second St., Philadelphia, featured two types of motor-driven extractors, both under and over driven. The under-driven machine had the rotor mounted directly on the basket shaft, so that there is but one moving part. With the motor underneath, complete access to the basket is afforded, it was pointed out, and there is no danger of dirt or oil reaching the goods. The over driven type had a vertical motor directly connected to the basket shaft. Both machines had ball bearings running in oil baths, assuring smooth running and low power consumption. The brake interlocks with the control, so eliminating the possibility of having the brake and current on at the same time. The exhibit was attended by C. William Schaum, W. H. Rometsch, Jr., C. E. Llewellyn and H. Morshead, southern representative.

J. B. Ford Company, manufacturers of chemicals, Wyandotte, Michigan, were on hand with their display of manufactured products on which "Wyandotte" chemicals had been used. They were emphasizing the use of these materials on artificial silk products, and were showing yarns and hosiery, sweaters, bathing suits, etc., for this purpose. Fred S. Klebart, manager of the textile department, was in charge of the exhibit, and John Turner and Robert Barr of the Philadelphia office and H. H. Willis, of New York, were also in attendance.

Foster Machine Company, Westfield, Mass., operated Model 30, Model 35 and Model 12A winding machines demonstrating their application on cotton, wool and worsted yarns. Also shown and in operation was a Model 35 long traverse cone winder winding yarn from skein to cone for use in outerwear knitting mills. A new attachment—the No. 20 combination tension and slub catcher—was shown. Timothy E. Connor, sales manager, and D. W. Bridgman, C. B. Terry and J. Salva were present during the week.

Hemphill Company, Pawtucket, R. I., one of the regulars at the knit goods show, showed their usual comprehensive line of equipment in operation. This exhibit included a small size tip and stripe machine, 130-needle, 2½-inch diameter; a sinker drop stitch machine, 220-needle, 3½-inch, on half-hose; a 220-needle, 3½-inch, on men's half-hose, equipped with the high splice, double sole cutter; a 160-needle, 3½-inch split foot machine making half-hose; an accordion stitch machine, 200-needle, 3¾-inch, on half-hose. A feature of the exhibit was a 240-needle, 3½-inch split sole machine on half-hose. There were also a 240-needle, 3½-inch accordion stitch machine on ladies' work; a spring beard needle machine, 248-needle, 3½-inch, on ladies' goods; and a 240-needle, 3½-inch, split sole machine on ladies' goods. An interesting part of this display was a No. 3 machine that was one of the first underwear machines built by the company, and which has been running up the the 1st of March.

John Lawson, president, and M. L. Frost, vice president, were in attendance at this exhibit, as were George McDowell, James McDowell, H. Ketterly, and Stephen Morris, of the Philadelphia office, Eugene M. Gunning, the manager of the Canadian office at Hamilton, Ontario, Herbert E. Gosling, manager of the southern office at Chattanooga, with C. I. Chaney, also from this office, Frank Jones, F. B. Martinez, A. Gagne, Harry F. Bentley and Robert Lawson, from the factory.

Kali Manufacturing Company, 1404 North Front Street, Philadelphia, Pa., featured in their exhibit a recently developed coning oil for artificial silk, known as Hydroxy art-silk coning oil. The features secured through the use of this solution, as explained during the show, are that its application affords easier knitting; the silk in process gives considerably reduced trouble in breaking down; and when the product goes to the dyehouse the solution can be removed by the dyer in a temperature as low as 100 degrees. It also produces an evener shade on the product, it was pointed out. This feature of the Kali exhibit created considerable interest among visitors at the show. It was explained that it can be applied to the silk in a number of ways—by soaking, spraying, through the use of a special roller, or in any way best adapted to suit local conditions.

In addition, this exhibit included the well known "Developene," boil off oil for degumming silk, "Hydroxy" Turkey red oil, kier oil to be used before bleaching or dyeing, wool scouring oil, "Olive" silk finish, olive oil soap, and a complete line of dyehouse chemicals, gums and glues. Also displayed was the "Kali" chlorine neutralizer, for preventing tender bleached goods. James A. Branegan and S. G. Davenport, president and secretary-treasurer of the company, respectively, were present at the booth during the week, being assisted by John Donlen, of the New York office, and Eugene Wall of Philadelphia.

Klauder-Weldon Dyeing Machine Co., Bethayres, Pa., stated they had planned a machinery exhibit, but that demands on their equipment were so great they felt they could not spare a machine for demonstration purposes. They therefore maintained reception space where Alexander Fea, H. Higgs, of Providence, and Joseph Wilson, general superintendent of the plant, greeted their friends.

Link-Belt Company, Philadelphia, were exhibiting this year with a "Link-Belt" silent chain in operation to demonstrate the positive, smooth action when applied to high speed motor equipment. Samples of various chains, and illustrations of typical installations were on display. H. D. Mitchell represented the company at this exhibit.

David Lupton's Sons Company, Allegheny Avenue and Tulip Street, Philadelphia, showed a comprehensive line of steel equipment for textile mills, emphasizing especially the steel looping and seaming tables, shown in actual factory use, steel hosiery boxes, storage damp boxes, box trucks, topping tables, hosiery trucks, steel shelving, cabinets and foremen's desks. F. W. Eickhoff, F. E. Fagan, George Gallico, H. E. Walter and G. S. Hingston were in attendance during the week.

Mathieson Alkali Works, Inc., 25 West 43rd Street, New York City, had an interesting exhibit in which they were demonstrating a recommended method of discharging liquid chlorine into the caustic soda or soda ash solution. It was pointed out that in the usual method of carrying out this operation, with the chlorine tank set upright, as the liquid chlorine passes out into the bleach liquor frost is formed on the outside of the chlorine tank, necessitating in instances the placing of the tank in a tub of warm water to dissipate this formation of frost; then as the chlorine is discharged into the liquor the combination liberates heat, raising the temperature above the point at which the desired sodium hypoclorite solution may be formed.

The system being demonstrated at this exhibit was designed to eliminate these disadvantages and inconveniences. The method is simply to invert the tank of chlorine, letting it discharge into the liquor through the usual perforated tube. The feature explained is that this method applies the refrigeration to advantage as against the disadvantage in the other method; it allows a faster feed of the chlorine, and another advantage pointed out is that when the settings of the entry valves have once been determined for the local case, it is not necessary to alter this setting, even after the tank of chlorine being used is exhausted and is replaced by another tank. The same setting applies to all subsequent baths.

In addition to this demonstration, the representatives present were explaining the complete line of "Eagle Thistle" products made by this company. William D. Marshall, district sales manager in the Philadelphia territory, and R. A. McMichael, assistant district sales manager, with Mr.

Levine of the Friedlander Supply Co., Philadelphia distributors, were on hand during the week.

Merrow Machine Company, Hartford, Conn., exhibited standard models of many of their machines, in operation, and distributed catalogs, instruction books and other literature on their high speed, overseaming, overedging and shell stitch machines. They showed the style 60D 2 and 3 thread machines for seaming and edging knitted underwear; style 60 DH for hemming balbriggan shirts; styles 60 AD and 60-ADSS machines for finishing sweaters, various adaptations of style 60UD machine for toe closing, mending seconds, mock seaming and clocking; style 60S machine for welting tops of ladies' stockings; and style 35FJ for finishing ladies' knit underwear, especially the necks; and other models. E. H. Allen, manager of the Philadelphia office, was in charge of the exhibit, and W. J. Longley and J. B. Tolan were also in attendance. Others present were P. G. Merrow, secretary and treasurer, and J. G. G. Merrow and O. W. Merrow from the New York office.

National Aniline & Chemical Co., Inc., New York City, were represented with their usual elaborate exhibit, formed this year by a background of red surrounding a large photograph of the Buffalo plant, and artistic artificial flower and vine embellishments combining to give a pleasing effect. Exhibits of well known makes of hosiery demonstrating the application of "National" dyes were made. Dr. Louis J. Matos was in charge of the exhibit, and others in attendance were Dr. G. L. Gilbert, Dr. H. Waffenschmidt, W. H. Willard, from the southern office, George Schott, Mr. Shuford, and S. W. Wood and A. A. Wood from the Philadelphia office.

Philadelphia Drying Machinery Company, 3351 Stokley Street, featured a monel metal dyeing machine for hosiery in colors, equipped with latest improvements including the automatic reverse motion, and so equipped as to eliminate the necessity for dyenets. Also shown was their regular loop dryer for underwear and turkish towels. Interesting photographic views of installations and other scenes were on display. F. Allsop, president, W. W. Sibson, secretary-treasurer, C. H. Reumann, sales manager, H. O. Kaufmann, New York representative, H. Morshead, southern representative, S. Watson, Pennsylvania representative, and E. Parkin were among those prsent.

Parks-Cramer Company, Fitchburg, Massachusetts, were another new exhibitor at this exhibition. They had no equipment in operation, but maintained reception space for the discussion of the application of humidification to knitting mills. This is especially important in mills doing spring needle knitting, it was pointed out, in the cutting down of static electricity, and also in setting the twist in the yarn and preventing kinks and preventing the yarn from throwing out of the needle. L. F. Ross, of the Fitchburg headquarters, was present during the week.

Proctor & Schwartz, Inc., Seventh Street and Tabor Road, Philadelphia, Pa., were featuring the Proctor automatic boarding, drying and stripping machine in operation, as well as other machinery of their manufacture.

Also at this space the representatives were explaining the "Smith-Furbush" line of textile machinery, including cards, garnetts, felting and waste machinery, which is being manufactured by Proctor & Schwartz, Inc., the combination of the Smith & Furbush Company with this organization having been consummated several months ago. Following were those who were present at this booth throughout the week: Fred Kershaw, vice president and general sales manager, C. T. Griffith, P. G. Kent, J. F. Moranz,, C. S. Tiers, L. E. Foyle, and F. Strockbine.

Roessler & Hasslacher Chemical Co., New York City, through their peroxide department, were displaying a large variety of well known knitted products demonstrating the application of the "Solozone" process in bleaching cotton, wool, silk, etc. Explanatory charts of the cost of Solozone bleaching for cotton piece goods were also displayed. C. D. Potter was in charge of the exhibit.

Royal Metal Manufacturing Co., 2318 S. Western Avenue, Chicago, Ill., were exhibiting their equipment and stressing the importance of correct seating facilities in the knitting mill. Among the equipment shown were topper's, seamer's, mender's, looper's and folder's chairs and stools, and the features being explained were the adjustable height, adjustable back to shape in accordance with the worker's back, large wood seats, etc. Irving Solomon, manager of the industrial seating division and the office furniture division, was in charge during the week.

Sandoz Chemical Company, 238 Water Street, New York City, had an attractive display of samples of tapestries, hosiery —silk, wool and cotton—and other products upon which their aniline colors had been used. They were featuring Diazo Fast Black V, a black whose characteristics are fastness to light and washing, it was stated. E. W. Seasongood, had charge of the exhibit, being assisted by Alfred Koch and Neal MacNeill.

Henry L. Scott & Co., Providence, R. I., showed a complete line of testing equipment, including a strength testing machine with autographic recorder, as well as the conventional types of yarn testing machines, reels, inspecting machines, drying oven, etc. They were equipped for full yarn analysis and testing during the exhibition. Also exhibited was an "American" air purifier, for humidifying small rooms. David C. Scott was in charge of the exhibit, being assisted by Enoch B. Bolton and Charles H. Huggins, Jr.

Scott & Williams, Inc., 366 Broadway, New York City, showed their usual full and comprehensive line of knitting machinery, displaying altogether 19 machines—16 hosiery machines and three underwear machines. The hosiery machinery consisted of the following: A Model B machine, which showed the old method of transferring, and on the other side of the shaft a Model H-H, which is the new method of transferring, fully automatic. At the booth it was stated that the Model H-H is meeting with high approval not only because of its saving in labor, but also because it runs with a very low percentage of waste. Also shown were several Model K machines with different gauges, one of the Model K machines which created considerable interest was one equipped with a tapered heel attachment. Then there was a line of sizes in the RI machines, making sizes 5 to 9; an automatic rib machine producing ribbed tops and plain foot and ribbed instep effects. These machines, fully automatic, are similar in construction to the Model H.H, except the former do no transferring, but introduce the dial needles instead of transferring from the dial needles to the cylinder needles as is done on the H-H. The underwear machinery division of the exhibit consisted of a 12-cut, automatic body machine, running 1 and 1; a 14-cut 1 and 1 plain rib machine; and also a small band machine, of which it was pointed out a great many are in use. A corps of represen-

tatives from the company were on hand during show week.

B. F. Sturtevant Co., Hyde Park, Boston, Mass., had in operation their low temperature, forced circulation hosiery dryer on full fashioned work. This dryer consists of a standardized unit containing three separate compartments, each of which holds one dozen stocking forms and is fitted with its individual special drying fan, which forces a circulation of low-temperature air through the compartment at a high velocity, lengthwise of the form from foot to top. The capacity varies from six to ten dozen pairs per hour. Aden I. Eyster and W. F. Muller, of the Textile Machine Works, Reading, Pa., who are the sole selling agents for this dryer, represented the company at this exhibit.

Tolhurst Machine Works, Troy, N. Y., were demonstrating in operation a 40-inch direct motor driven self-balancing extractor, with bronze and copper basket, tinned inside. The vertical motor, placed on top of the machine, was operated by means of a magnetic switch with overload relays and under-load protection; push-button control. On this extractor the brake is interlocked with the connection to the motor so that the current cannot be applied while the brake is on. In order to stop the machine, the operator merely touches the brake which automatically throws off the power and applies the brake.

One of the new features of the machine which was being explained is a cast aluminum guard which has holes about 1-inch in diameter in it which permits the operator to look inside the basket. The spindle is equipped with a cast aluminum cone lock which will not allow the guard to be raised while the basket is in motion and the guard is so interlocked with the connections to the motor that power cannot be applied while the guard is open, it was pointed out, and it was further stated that these safety features have been approved by the labor departments of the different states. Rodney K. Cheney, sales manager, Wilmer C. Dutton, vice president in charge of the New York office, T. M. Stuart, Earle D. Rhodes and John McKeon, were present during the week.

Torrington Co., Torrington, Conn., were represented in the space of their agents, the Manufacturers' Supplies Co., of Philadelphia, with a complete display of "Excelsior" knitting needles for various uses. C. Rowe, L. J. Ross and Mr. Morgan represented the Torrington Company at this space.

Trump Brothers Machine Co., Wilmington, Del., were operating two of their latest machines: a 16-inch, 8-feed, 14-cut machine and an 18-inch, 12-feed, 12-cut machine, equipped with the latest improved sectional cam dial and safety stop. Also shown was a panel of Trump drills. W. Frederick, vice president, F. H. Thomas, general sales manager, and A. W. Cutts were present throughout the week.

Universal Winding Company, Boston, Mass., showed three types of machines: the No. 80 for winding the supercone for underwear; the No. 50 for winding silk; and the No. 16, high speed semi-automatic winder. F. H. Bishop, vice president; Arthur I. Harvey, general agent, and Frank J. Quinn, manager of the Philadelphia office, represented the company at this exhibit.

Wildman Manufacturing Company, Norristown, Pa., were displaying and demonstrating the following equipment: an underwear tape machine; a rib machine for ladies' cuff tops; a hosiery machine for cuff tops and one for turned welt; an automatic necktie machine with Jacquard pattern mechanism; a spring needle underwear machine with yarn controlling furnishing wheels.

One of the features of this exhibit was a new combination bathing suit and sweater machine, the pattern mechanism of which is controlled by the Jacquard system. This machine, making all ribbed fabric, can produce sweaters and bathing suits in eight different colors, and to change the pattern all that is necessary is to change the paper pattern mechanism.

K. Howie, general manager, D. C. Bellas, F. E. Paul, E. S. Kennedy, and J. J. Brennen were among those in attendance upon the exhibit representing the Wildman Company.

Jacques Wolf & Company, Passaic, N. J., were displaying samples of Monopole oil, hydrosulphites, bleaching oil, cream softener, diastazyme, etc. They also exhibited samples of finished knitted products in whose processing the use of their oils was embodied. A large picture of the Passaic plant was the central figure of the exhibit. F. J. Henckel was in charge of the exhibit, being assisted by A. J. Royce.

Prospects for Full Fashioned Hosiery.

The practicability of establishing a full fashioned hosiery mill in the South, to sell to retailers direct, is dealt with in correspondence growing out of the submission of the question by a person who had such a project in view. Among his specific questions were:

Would a capital of $150,000 be sufficient, about one-half to be invested in machinery?

Which gauge would be preferable for a 12-thread stocking—39 or 42?

Would retailers be more ready to pay $18 a dozen for a 12 thread stocking of the more desirable gauge, to retail at $2 a pair, than $16.50 for an inferior stocking to sell at the same price?

I am told, the inquirer wrote, that there are 108 full fashioned hosiery mills in the United States, four of these being in the South; that statistics as of December 1, 1922, showed for November an aggregate production of 433,866 dozens; orders booked for 750,000 dozens; unfilled orders 2,034,069 dozens and 404,413 dozens of finished goods in the mill:

The inquirer's letter, with extracts from replies of a number of manufacturers, was printed in April Knitting Mill News. One manufacturer is quoted as saying the outlook for full fashioned hosiery is very good, that demand is increasing day by day and will be lasting for many years, and that more manufacturers now operating latch needle machines are installing full fashion machines.

There still is a great field for full fashioned hosiery, a representative of a company building flat knitting machines wrote, and the trend is toward the finer gauges, but that whether the product be 39 or 42 gauge may make little difference although for the stocking indicated by the inquirer, 42 probably would be preferable.

"It would be a safe proposition to establish a full fashioned silk hosiery mill in the South," a dyeing machine builder replied.

Referring to the statistics for November 1922, one manufacturer quoted government figures for showing that production was keeping pace with orders and that there was

available 50 per cent of the hosiery required for filling orders on the books, which it was assumed were for delivery during the succeeding six months. "With production one jump ahead of demand." he wrote, "it would seem that the necessity for increased production is a matter of the far distant future."

Another manufacturer thought a full fashioned mill in the South would not be a very good proposition, and he questioned the feasibility of a new concern manufacturing to sell to retailers direct, citing the changes in the selling policy of the Durham Hosiery Mills and the United Hosiery Mills Corporation.

"Any person not in the full fashioned game is lucky," a manufacturer thought, "and it would be a good thing to stay out of it for the time being."

Stating he believed the outlook for full fashioned hosiery for the next few years to be good, one manufacturer feared production will be overdone and the market flooded with goods to be sold at cost, or under, by concerns not having an established outlet. "At present," he stated, "the market seems to be flooded with all kinds of merchandise, and there's no stable price for anything, but we hope conditions will change with more seasonable weather."

Another manufacturer wrote: "While the writer is of the opinion that the use of full fashioned silk hosiery is firmly established for the future, he has a feeling, shared by a number of manufacturers, that the large production of full fashioned machinery at the present time will soon bring about, if it has not done so already, closer competition in silk hosiery than heretofore. If this is correct, nearly all merchandise of this type will have to be sold on a closer margin of profit. There is no doubt there will be a good business, but if it comes down to close competition, the small producer will probably suffer somewhat in comparison with the larger one."

A mill executive who inclines to the belief there is overproduction of full fashioned hosiery says: "Insofar as we can learn, most of the full fashioned mills, especially in the Philadelphia district, are now very short of orders and most mills are running on short time. This is especially true of the mills that are selling their product through jobbers. The only mills that we know of that are really busy at present are the ones who are selling their product direct to the retailer under their own nationally advertised brands. Such firms as the Phoenix, Holeproof, Allen A and some others are, we believe, unusually busy, as is also the Berkshire."

Among the Knitting Mills.

Fashion Hosiery Mill, Athens, Tenn., is erecting an extensive addition to its plant which will double its output. This is the second enlargement that this mill has made in the past year, and will consist of a boarding room and warehouse. H. A. Vestal is manager.

Pointer Hosiery Co., High Point, N. C., is a new corporation organized for the manufacture of hosiery. The capitalization is $125,000. E. H. Covington, J. H. Adams, and W. C. Covington are among the incorporators.

Work on additions which will practically double the capacity of the plant is nearing completion at the Perkins Hosiery Mills, Columbus, Ga.

It is anticipated by officials of the company that the Princeton Hosiery Mills, Princeton, W. Va., will be in operation by May 15. The new plant is fast nearing completion. The initial installation will include 60 knitting machines for knitting cotton and silk hosiery. A dyehouse is included in the plant, and the concern will also dye, bleach and finish for outside trade. Lowery G. Bowling is president with L. H. Perkins secretary-treasurer.

Perfection Knitting Mill, 2654 Pico Street, Los Angeles, California, will erect a new one-story mill, 50 x 140 feet.

A hosiery mill is planned for West Nashville by L. E. Stephens, 5000 Wyoming Avenue, West Nashville, Tenn.

Simultaneous with the change in the name of the Southern Hosiery Mill, Chattanooga, Tenn., to the McAllester Hosiery Mill, announcement was made that a substantial addition to the equipment of the plant, which will increase the output about one-third, will be effected. The mill manufactures misses' and children's ribbed hose. Will Cummings is president, C. S. Andrews vice president, and W. L. McAllester treasurer and general manager. Sam J. McAllester is secretary.

Sunlight Hosiery Mills, Blackville, S. C., is installing a water-softening plant and storage tank. Twenty-four new hosiery drying forms are being added to the equipment. E. E. Partain is manager.

The underwear factory of E. Emmers & Co., at Royersford, Pa., recently destroyed by fire, will be rebuilt, it is stated by officials.

Additional new machinery will be installed by the Janet Hosiery Mills, Shelby, N. C., for increasing the output of the plant, which produces mercerized and combed yarn hosiery.

B. A. Fryer, 731 Jefferson Avenue, Buffalo, N. Y., has plans under way for the establishment of a knitting mill.

Phiimore Knitwear Mills, Brooklyn, N. Y., recently organized with $10,000 capital, will manufacture hosiery. A. Wertheim and S. Schleimer head the company.

Bonton Knitting Mills, Inc., has been organized at Brooklyn, N. Y., with a nominal capital of $5,000 to operate a mill. The company is headed by B. Robins and G. Warner.

Ballard Knitting Mills, Inc., Royersford, Pa., has plans under way for the construction of a new mill.

Fanning Knitting Mills, Inc., Brooklyn, N. Y., have been incorporated for the manufacture of knit goods. The capital is $20,000. E. Tobias and K. T. Fanning head the organization.

H. Berlin, H. Hoffman and J. Cherin head the recently organized Elton Knitting Mills, New York City, which will operate a plant to produce knit goods specialties.

Seville Knitting Corporation, New York, N. Y., recently incorporated with a capital of $200,000, will operate a plant for the manufacture of yarns, knit goods, etc. The company is headed by Nesib Trabuisi, 83 Rugby Road, Brooklyn, N. Y.

The Auburn (Pa.) Knitting Mills are planning for the installation of new knitting machines and other equipment for a considerable increase in production.

Oneita Knitting Mills, Utica, N. Y., will install machinery to manufacture knitted cotton-ribbed underwear products.

The Janome Knit-Cloth Corporation, New York City, has been incorporated to operate a knitting mill.

The Yarn Market

Yarn prices at the end of the past month as reported here were not as healthy as they were at the beginning of the period, a general loss of between one and three cents on the more used counts being noted. This reduction resulted from a month of irregularity and contrasts, with varying opinions and attitudes on the part of spinners, dealers, and consumers of the products of this market.

The first week of the period saw prices elevated considerably, advances of around one-half cent to three cents being put into effect and noted. This applied to the more regularly used counts of the ordinary grades. A general feeling of optimism was felt throughout the market in regard to the future possibilities of the yarn situation and most factors predicted a more active market development within a few weeks. It was brought out as the general opinion that consumers of yarn were covered through June, and this same feeling was held regarding the spinners of the yarn, discounting of course the usual exceptions in both instances.

Knitters generally were reported to be enjoying much better business than has been experienced since last fall, reflecting the widespread feeling of prosperity and better times over the country, but while there was a usual amount of business done, nothing startling in this connection developed. However, the sellers seemed more or less unconcerned with the situation, apparently content to await the development of a position that would bring their asking rates and the prices offered by users more closely into line, with the former remaining at least stationary and the latter moving upward.

The second week of the period brought about a general decline in prices ranging from a half a cent to two cents on the pound, according to the grade and count. Quite a few of the selling contingent acquiesced with reductions, but on the other hand there were those who retained their stand of firmness. However, pressure brought to bear was sufficiently strong to bring the general average of prices down. Buying on the whole was slow and uninteresting, but it was pointed out that this was counteracted by the fact that no large stocks of yarn were offered at concessions to destroy the stability which the market has apparently enjoyed of late and which seems to be regularly increasing.

The latter part of the period saw further general reductions in the list, but with indicated examples of spinners remaining firm in their stand. It was true, however, that prices did slump noticeably during this time, and reports were made of spinners acceding to offers of business at concession prices in order to build up bookings; that combed yarns, which have not been feeling good for a long time, were sliced to where they were offered as substitutes at carded yarn rates. On the whole, however, the anticipation on the part of practically all of the market is one of confidence and a feeling that a better market is coming prevails. It is a fact that the market is on a much better plane of stability than it has enjoyed for some time, and reports coming in from authentic sources indicating prompt payment of bills and other indices to better conditions substantiate this. During the month on the business done 20s/2 and single carded skeins, single carded warps up to 16s, and single carded cones of the coarser counts were in noticeable demand.

Following are quotations published on the Philadelphia market on April 17:

Single Skeins.

4s to 8s	43½ @44		
10s	45	12s	45½
14s	46½	16s	47½
20s	50½ @51	24s	5 @54
26s	56½	30s	57½ @58

Single Warps.

8s	44½		
10s	45½	12s	46½
14s	47½	16s	49½
20s	51	26s	57½ @58
30s	59½ @60	40s	68 @69

Carpet and Upholstery Yarn in Skeins.

8s and 8s 2-4 slack	43½
8 3-4 tinged tubes	41
8 3-4 hard white warp twist	43½
8 3-4 hard twist waste	40½

Two-Ply Skeins.

8s and 9s 2-4 slack	43½		
12s	45½	14s	47 @47½
16s	49 @49½	20s	51
24s	55½	26s	57½ @58
20s	59½ @60	40s	67 @68

Two-Ply Warps

8s	45½	10s	46½
12s	47½	14s	48½
16s	49½	20s	51½ @52
24s	57½	26s	59½ @60
30s	59½ @60	40s	67 @68

Frame Spun Carded Yarn on Cones

8s	43	10s	43½
12s	44	14s	44½
16s	45 @45½	18s	46 @46½
20s	47 @47½	22s	48 @48½
24s	49 @49½	26s	51 @51½
30s	53½ @54	40s	67
30s double carded	56 @57		
30s tying-in	49		

Two-Ply Combed Peeler Skeins and Warps

8s to 16s	61 @62		
20s	63	24s	65
30s	70 @72	40s	75 @78
50s	85 @88	60s	95 @$1.00
70s	$1.05@$1.10	80s	$1.25@$1.30

Mule Spun Carded Yarn on Cones

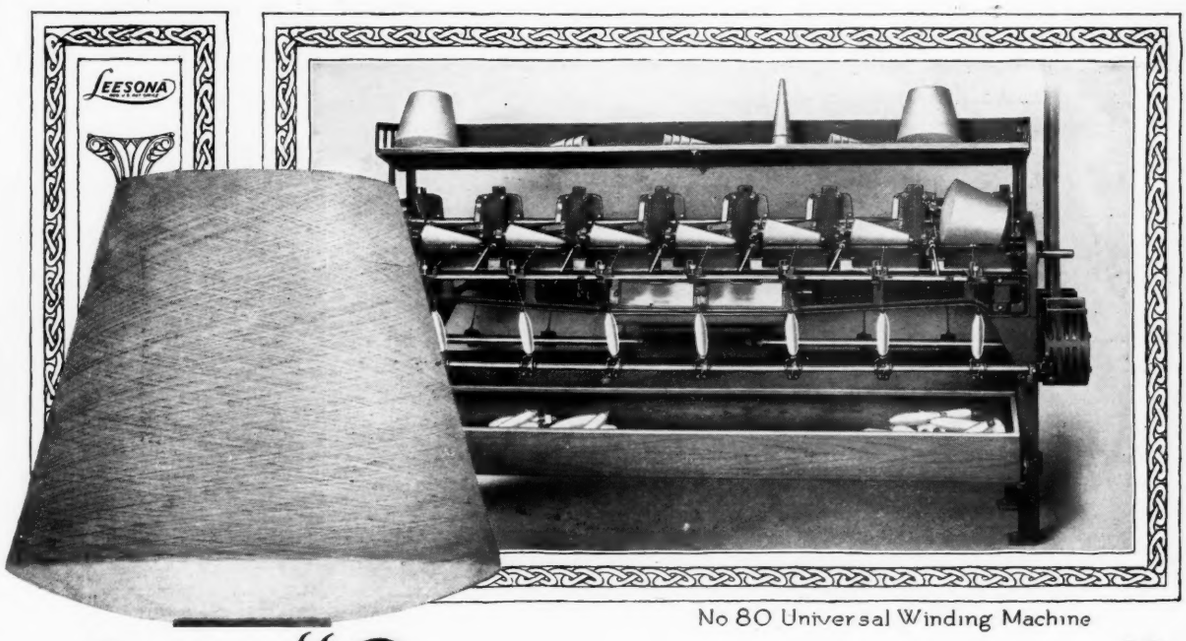
10s	48	12s	48½
14s	49½	16s	50
18s	51	20s	52
24s	54	26s	55
30s	61 @62	40s	72

Mule Spun Combed Peeler Yarn on Cones

10s	53 @54		
12s	54 @55	14s	55 @56
16s	57 @58	18s	58 @59
20s	60 @61	22s	63 @64
26s	68 @69	28s	72 @73
30s	75 @76	36s	79 @81
38s	83 @84	40s	85 @90

J. B. Jamieson Company, of Boston, one of the large eastern cotton yarn commission houses, who formerly largely confined their business to yarns made in the East, have, during the last few years, taken on southern yarn accounts, and are now large factors in the southern yarn business. They cater to all users of yarns, handling combed and carded qualities for weaving, knitting, braiding and other purposes. Boston is their headquarters, but their salesmen cover all the New England states. They state they are looking for a few new mill accounts, and manufacturers of yarns desirous of securing selling representation will doubtless find the "House of Jamieson" a satisfactory outlet for their products in the East.

W. E. Bradley, a very well known figure in Philadelphia yarn circles, has entered business for himself under the name of Bradley Yarn Company, with offices at 415 Mariner and Merchant Building, 308 Chestnut Street, Philadelphia. Mr. Bradley's friends in the industry will be interested to know of his new venture and wish him success.



No 80 Universal Winding Machine

The "Supercone"

Knitting mills feeding spring needle machines from Supercones wound on the No. 80 Universal Winding Machine are enthusiastic in their praise of the economies and advantages of the Supercone,

—ten hours continuous running without stopping to renew yarn supply practically doubling the uninterrupted run when other forms of yarn supply are used.

—supercones wound on inexpensive paper cones eliminates the big investment and up-keep and the handling of expensive, heavy wooden bobbins.

Waste is reduced, production increased, quality of finished product improved and production costs *materially* lowered.

Operators prefer the Supercone as they have fewer motions to make, no heavy bottle bobbins to carry and they doff Supercones but twice a day.

Past achievements of the Supercone are interesting, but its possibilities in your mill are far more important to you.

A Universal Engineer will gladly lay all facts before you without the slightest obligation on your part.

Supercone vs. Bottle Bobbin

"The Supercone"	Bottle Bobbin
Yarn 6¼ pounds	Yarn 2½ pounds
Paper cone ½ pound	Wood 3 pounds
Cone tubes cost	Bobbins cost
1½ cents.	1½ dollars.

Write for folder "Supercone vs. Bottle Bobbin."

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The Knit Goods Market

Outstanding among the ups and downs in the hosiery trade is the shifting of the position of the two major divisions, cotton and silk, which from the standpoint of comparative stability and fairly ready sale at prices more nearly representative of value, have completely reversed their status. It is but a few years since silk hosiery was in scant supply and strong demand, marketable at almost any price sellers were willing to put upon it and buyers offering premiums for prompt delivery. Cotton hosiery at that time was a drug, warehouses being gorged with it and mills idle because of lack of orders. Broadly speaking, the reverse is true today of these two hosiery divisions.

Cotton hosiery has been moving fairly well for some months, at continually advancing prices, notwithstanding outspoken resistance, and the deferring of commitments by jobbers to the extent that many now are regretful of their bear attitude while cotton and yarns were gradually climbing higher. Certain lines of cotton hosiery were taken off sale during April because mills had sold as far ahead as they were willing to sell at the prices then prevailing. Manufacturers were in arrears with deliveries, and jobbers calling for goods that ought to have been in their warehouses a month before.

In respect to warrant for operating mills at capacity, many manufacturers were better situated than for a long time, and so confident of prices sticking that some were running their machines overtime for accumulating goods that, it was realized, will be wanted later, when, production costs will be materially higher than they have been.

Activity in cotton hosiery is not to be construed as indicating normal operations by jobbers. There has been considerable withholding of commitments among those fearful of carrying stocks into the next cotton year. Notwithstanding they misjudged the market late last year, and are left to buy goods at higher prices than then were contemplated, distributors in the ultra cautious class even now are disposed to keep commitments down to a minimum.

Of course there are exceptions. One of these is a jobber who several weeks ago came up from Texas and bought more goods for fall than he had contracted for so far in advance since 1919. Another southern jobber bought more heavily than usual and was disappointed at not being able to get seller's assent to monthly deliveries from June to October, inclusive. The best the manufacturer would do was to scatter the deliveries over only June and July. Prices seemed right and the jobber placed the order for as many cases as he would have bought had he contracted for deliveries running through to October.

Some hosiery jobbers have had a falling off in their sales, according to their own reports, because they ran out of goods bought at comparatively low prices, and could not, they said, sell at the advances which they now must pay. One such jobber noted a radical slump in March, when his house put higher prices into effect. But it appears he is not going to profit by experience, for he has stated that when he has sold the fall goods which he contracted for in December and January he will call in his salesmen, doubtful whether .they could do business on the higher prices that he admits manufacturers are justified in naming. He has unwittingly fired an early gun in a buyers strike—not a consumer strike.

Many of the southern mills are especially well supplied with business and note demand sufficient to warrant them moving prices to a level more nearly approximating replacement, A North Carolina mill is selling misses coarse gauge ribs at $1.05 a dozen, which is precisely 20 cents a dozen under prices at which it is making deliveries of goods sold to jobbers last fall. It is understood that one or two manufacturers are getting $1.10 for a similar stocking, and according to one or two jobbers one mill line is available at an even dollar. Some of the more important jobbers who are sticklers for deliveries as per specifications have been reluctant to contract with certain low price mills, fearing it might be found convenient to abrogate contracts in the event manufacturers must pay above April prices for yarn. The significance of this is perhaps apparent in the fact that at the prices at which a number of lines of cotton hosiery are being sold they are fetching no more than replacement value based on yarns made from cotton around 30 cents.

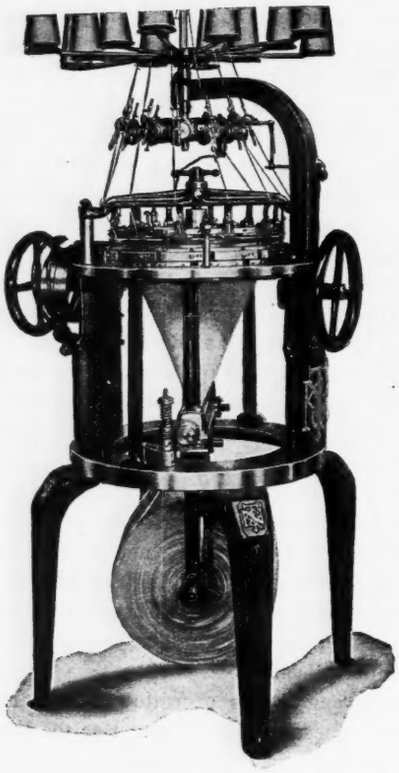
A northern mill, after selling pretty well ahead of boys three pound ribs, advanced the price 20 cents, but, it is stated, is booking few orders at the new figures. One mill is quoting $2.25 for the ribs, this being regarded lower than is justified by production costs. Another mill is asking $2 for ribs weighing 2 pounds, 12 ounces, and reports jobbers are not excited over them.

Among the strong sellers of cotton hosiery have been 176 needle and 84 needle work socks. For the latter there developed a demand somewhat suddenly, and the heavy socks continued to sell freely for fall. Women's low end hosiery is in practically as good a position as men's, and there has been particularly widespread buying of misses combed ribs, variously quoted at from $1.75 to $1.90. A Tennessee mill, operating a branch, booked so much business on this class of goods that there was some thought of expanding the plant. Another southern mill sold well ahead at $1.85 and now is holding for $1.90.

Jobbers have been particularly antagonistic to advances in misses combed ribs, and in more than one instance have come along with offers of 100 case orders at former prices after revised prices had become effective. They overstayed the market and are paying the penalty in advances of 5 to 10 cents a dozen, which, it appears have met with a great deal of resistance from retailers. A leading mill selling direct to retailers moved its prices up by one dime a dozen and by the middle of April had sold for fall over 30 per cent more than to the corresponding date of 1922. For some manufacturers 1923 has been a banner year in the matter of production and advance selling.

There has been a good movement in men's and women's combed hosiery, attributed to the fact that prices underwent minimum revision, due to the lagging of combed yarn as in contrast with carded. Combed socks of double sole and high spliced heel have been particularly good sellers for manufacturers whose lines had been established in the trade, but there is a fear that higher prices will for a time halt buying.

One important mill making a well known line of combed half hose had to deal with a demand for increased pay and,



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American Laundry Machinery Co., Ltd., London, England.

Automatic Safe!

realizing that it would be difficult to pass the increasing cost along to distributors, refused to accede to the wage and operating terms dictated by the employees. The result was a strike, and at this writing it has been in effect three weeks, with not the slightest indication the manufacturer will permit control of the mill to pass to the employees, who admittedly have been receiving a wage fully up to the schedule prevailing in the section of Pennsylvania where the mill is located.

Northern labor has become noticeably more indifferent of manufacturers' interests since wage increases went into effect in the New England piece goods mills. Mill help in Philadelphia, more particularly in the weaving and dyeing establishments, were quick to move for advances, and in some mills increases of 10 per cent have been granted without the formality of a strike.

It is a foregone conclusion the Philadelphia manufacturers of latch needle hosiery will have to reckon with advances when naming their new prices. In view of a prospective widespread agitation among hosiery mill operatives for more pay, a few manufacturers have deemed it the part of wisdom to make up goods for stock. To increase their prices now to conform to 10 per cent additions to pay scales, would, it is a practically safe prediction, be an incentive for jobbers to so curtail their purchases as to make it necessary to decrease production. The stand taken by distributors precludes the possibility of wage advances at this time, except at a loss to manufacturers, hence the logic of keeping labor employed so long as possible and making up goods in advance of a period of higher cost.

Desirable hosiery mill help is scarce in some sections, while comparatively plenty in others. There are mills in Philadelphia and in Reading which are having less capacity output only because there are not enough operatives of the kind that are wanted to man the machines.

In some respects the hosiery mill help situation is acute. If there shall be over-production to the extent that was common not so long ago there will be more operators looking for employment and fewer engaged in fomenting trouble for their employers. Only recently the few comparatively busy full fashioned mills in Philadelphia were besieged with applicants for work, these applicants being out of employment because of a slowing down on operations in the mills in which they had been engaged. There is need for more production in only a very few lines of hosiery, while in many there would be justification for slowing down.

Prices which some manufacturers are willing to accept for ladies mercerized hosiery indicate there is no demand for this class of goods that is in danger of not being supplied. One of the more important mills offers as a leader its line of 220 needle mercerized stockings at $2.50 a dozen, which is but 25 cents more than last year's price. Prices of other mills range from $2.62½ to $2.85, with probably more sales at $2.75 than at the higher figure. One establishment quotes $2.25 for ladies 200 needle full mercerized stockings; $2.50 for 240 needle, and $3.10 for 260 needle. That these prices are out of line is shown by the fact that one mill is selling 260 needle goods in a small way at $3.35, and a somewhat heavy 220 needle at $2.90.

Infants socks are but slowly recovering from the hammering to which they were subjected last year a few months after the opening, which was characterized by sharp price competition, virtually driving out of the market buyers who were willing to consider contracting, notwithstanding it was a current rumor there were large carry-over stocks from the preceding year. The market for infants goods slumped on excess production, after a period during which output and demand were pretty evenly balanced, the situation being slightly in favor of the seller. True to precedent, too many manufacturers decided inopportunely and about the same time to relieve the situation from the jobber viewpoint, with the usual result, excess output and an inordinate scramble for business. Jobbers were short of stock in 1921 and bought over-heavily for 1922, making the same mistake that was made by those manufacturers who rushed headlong into the game without pausing to contemplate the consequences of over-production. There developed early last year a similar situation in relation to hosiery of wool and wool and silk in combination, of which there was more for last winter than the market could absorb, numbers of manufacturers sustaining heavy losses on their higher priced goods.

There is no likelihood of a surplus production of silk and wool in combination this year. Manufacturers who have had an experience with this mixture, at anywhere from $12 to $16 a dozen to jobbers, are afraid of it, and distributors almost universally are passing it up as something to be handled with extraordinary care for the coming season. There has been good business for fall in ladies cotton heathers intended to retail at 50 cents a pair and up to $1; some little business in goods of a presumed retail value of $1.50 to $2, but very little in the class that would have to be sold higher over the counter. Very little is heard of the term heather except in its application to cotton and low priced goods of wool and cotton in mixture, showing a jumble of colors in brown, green and gold. Distributors have bought heavily of cotton heather half hose intended to go over the counter at 25 cents a pair and up to 50, the bulk of the business being in the lower grade.

Sports hosiery for women and misses look good for a long pull, and misses three-quarter length with fancy roll tops in distinctive and exclusive patterns have had a phenomenal run for a Philadelphia mill, which about the middle of April took the line off sale. It appears to have been the design in the top that gave this number such a commanding position, for a large establishment handling commonplace patterns of the three quarter length reports them not in demand at prices which can be obtained for children's plain colored of full length in which there is used about one third less mercerized yarn.

In contrast with an approach to stability in cotton hosiery staples, the silk division has suffered a bump, which seems to have culminated during April in offerings of very large quantities at prices under cost of production reckoned on raw silk at $2 and more under the market. There were several explanations for the sudden eagerness to unload. One was an apparently well grounded belief that raw silk was due for a smash. Another reason can be traced to changes in style and stocks of lines that once were popular and now are in the class of back numbers.

One concern offered 10,000 dozens of 12 thread 20 inch boot seamless stockings at $7 a dozen. A retailer to whom $7.50 was quoted said this figure was higher by more than $1 a dozen than that named by a jobber for comparable latch needle goods. On the basis of the raw silk market the

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A manufacturer who is a stickler for rigid inspection was looking for an outlet for 20,000 dozens of ladies high grade latch needle silk, which were represented as better than most irregulars. Twelve thread 20-inch boot embroidered were quoted by a commission house at $6.50 for 220 needle, and $8 for 240 needle, the latter with Swiss embroidery. It was the embroidery that killed the stocking from the standpoint of market value.

A well authenticated report that approximately 8,000 dozens of ladies full fashioned silk hose were offered by a manufacturer at several dollars a dozen under the market contributed to the confusion that already had existed. But there was a valid explanation for this low offering, in that the control of the mill had been purchased by interests which did not buy the stock of finished goods.

Investigation discloses that in almost every instance where sacrificial prices have been named there were reasons which do not figure when fresh goods from mills selling in the regular way are taken into consideration. It was perhaps wholesome for the trade the dumping should have come in advance of the opening of lines for fall, for now, by the time jobbers are ready to make their commitments, these troublesome surplus stocks probably will have been passed into distribution and gone through their period of usefulness.

Large retail stores have been conducting special sales at which standard full fashioned silks were sold at about the prices jobbers ordinarily pay the manufacturer. Such sales have been common in several large cities, hosiery bought by retailers at around $10 a dozen passing over the counter at $1.15 to $1.25 a pair. But these sales appear to have had no adverse effect on the business of manufacturers of chiffons and novelties in openwork clocking, for which apparently there is an increasing demand, with prospects of a bumper business in silk hosiery for winter and the ultimate passing of the once popular silk-and-wool.

Chiffons are the star performers on the silk hosiery stage. They will fetch more money, by far, than stockings of like grade carrying twice the weight of silk. A few mills are operating at capacity and have difficulty in keeping production up with sales. Late delivery of chiffons, plain and with openwork clocking, is not uncommon.

Mills selling to retailers direct seem not to have been hurt by the price slaughtering of left-over and otherwise burdensome stocks of silk hosiery, and some of these mills are able to obtain approximately fair prices. An important mill in the South is getting $12.50 for a 12 strand 240 needle seamless-made stockings with the fashion marks, this comparing with $12 for spring.

While there has been no complaint of a surplus of silk half hose, adequate prices are not easy to obtain, and high grade latch needle goods with split sole are available at around $5.50 a dozen, lower prices being heard for the lines of several mills. The low quotations are ascribed to the shrinkage in the spread between prices of full fashioned and latch needle socks, the former apparently having come into stronger favor for the coming season.

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Sentiment is running strong among a number of important hosiery manufacturers that raw silk shortly will reach the peak at around $10 and that by July there will be a sharp decline, estimated by some interests at $2.50 per pound. In fact, one leading operator in the wholesale Japan silk market states that it is within the range of probability best No. 1 to extra will be available within three months at $6 a pound. Manufacturers seem to have helped to force prices up, by pushing production, while at the same time disturbing the values of their finished product. It looks as though they had unwittingly played from both ends against the middle. Few hosiery mills have been buying raw silk except for filling in, and several of these have said they would welcome a break in Japan even before they had gotten rid of their high-priced stock. It is common opinion that, while 1923 is to be a bumper silk hosiery year, jobbers would operate so cautiously that higher prices would make conditions at the mill very unsatisfactory.

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As wage increases have been general and the purchasing power of the wage earning public expanded in proportion, it is not doubted in the primary market that consumption will be normal and that, therefore, demand for the remainder of the year will call for maximum production. Advance and fill-in business on fall underwear should be in very good volume unless the raw material market forces manufacturers to name still higher prices—higher than had been contemplated.

Some quite sharp advances on winter underwear have been recorded, the 16 pound cotton ribbed suits of a few mills being $2 higher than last year, and 11 pound shirts and drawers 75 cents up. A union suit of cotton and wool mixture—considerably more cotton than wool— has been moved up $1.50 a dozen, which means 50 cents more per garment in the retail store, as in the cotton ribbed for which mills are getting $2 more. It is the advances at the retail counter that seem to stagger jobbers. They probably overlook the fact that when prices were named they were figured on maximum output, with no thought of cotton going to 30 cents. Since then production has been unsatisfactory, due to scarcity of labor, more frequent labor turnover, and a disposition among many operatives to adapt their hours of employment to their own convenience rather than for meeting the trade situation.

Despite adverse circumstances, and not overlooking the lull in April, business in fall underwear may be said to be on a very satisfactory basis, more garments having been sold in even recent weeks than manufacturers had a right to expect they would sell. The bulk of next winter's garments was bought during the first three months of the year. Last year jobbers did not come actively into the market until along in March and April. One manufacturer reports sales to April 1st this year fully one hundred per cent in excess of the volume for the first quarter of 1922. It probably is true that to date jobbers have sold more underwear for next fall than they bought up to the corresponding date in 1922.

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Concrete Roads Aid South as Transportation Solves Problems of Cotton Industry

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In each of the great cotton raising states, cities are striving to outdo their rivals in the matter of modern facilities. Bigger and better mills, warehouses and compresses, more efficient methods of handling and above all interlocking transportation systems have been built as a result.

Today many southern states can thank the cotton industry for miles of permanent concrete highways. Built by the men who raise and transport cotton from their fields to market as a means of reducing costs, these highways serve great sections as arteries of commerce.

Tourists come from other sections, land values increase, other industries grow in proportion to the advancement of the districts through which the roads run. Few other places in America so well illustrate the truth of the fact that permanent hard surfaced highways pay for themselves.

And one of the greatest factors looking for future development is the fact that this advancement is cumulative. Each added mile of rigid roadway means more dollars coming into the pockets of the men who raise cotton. New territory is opened to the swift and economical transportation link that leads to the compress and the textile mill.

The example of Savannah is inspiring. Always a leader in shipments of southern products, particularly turpentine and other naval stores, this historic old city may soon find that cotton transportation has become its leading industry. One compress and warehouse plant in Savannah alone has more than forty acres laid in concrete. Loading platforms, grading floors, courts and driveways—over which the raw cotton is moved by electric trucks, each bearing a 10,000 pound load.

From all over the state added increments of cotton come in to the plant. Concrete roads radiate in four directions from the city and join other trade routes across the heart of Georgia.

In North and South Carolina the same thing is happening. Further west one finds increasing prosperity as thriving cotton centers build enduring trade routes to meet the competition of their neighbors. Great flotillas of cotton laden trucks make runs daily bearing loads that would have taken many teams to haul in other days. More plants are being built along these roads. Opportunities are opening to textile manufacturers. Cotton is coming into its own as the great crop of the South. And its foundation rests on the broad stretches of permanent highway that link field and plant and mill.

In the illustrations accompanying this article are the visual evidence of what an important thing a rigid pavement is to the cotton industry. Two scenes show the sanitary and efficient methods of routing raw cotton through the compress plant and into warehouses for shipment to the mills. Strings of trucks carry the bales from loading and grading platforms to the pressure balers, thence to storage and later on to train and shipboard.

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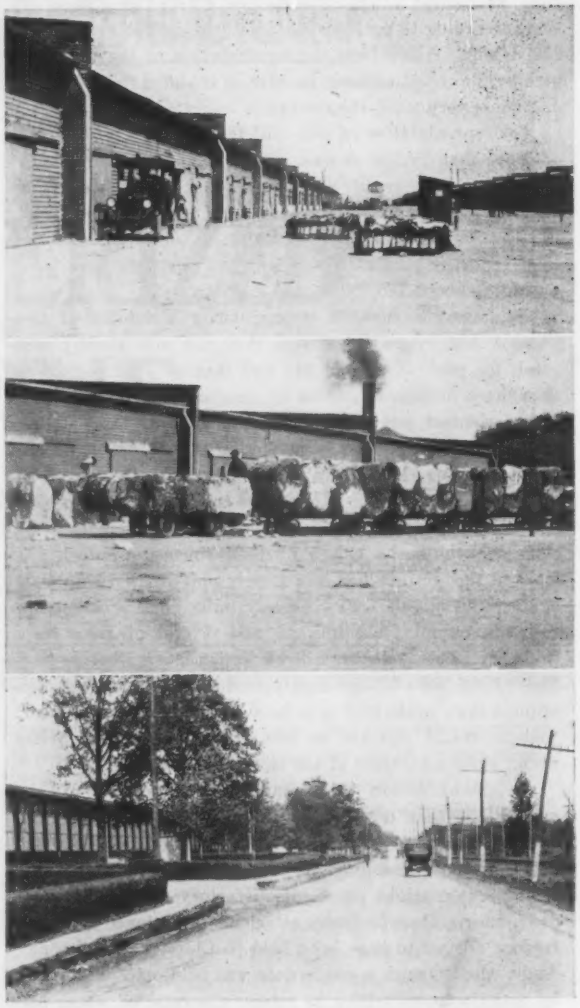

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AUTOGYP is the process of dyeing that entirely eliminates the disagreeable bleach for all time. It is not an experiment. It is the practical method of dyeing and bleaching in ONE operation. The AUTOGYP Process of Dyeing is rendering remarkable results at equally remarkable savings in mills all over the country. Not only does it bleach and dye to the required shade, but it also produces a better looking fabric with a softer feel, and further saves:

Six separate steps and operations—
3½% of shrinkage
25% of tensile strength.
50% of steam.
30% of labor.
90% of water.

It saves all the chemicals used in the chloride of lime method of bleaching. It saves boiling out in kiers or other appliances. No special skill or special equipment is necessary and no added expense involved.

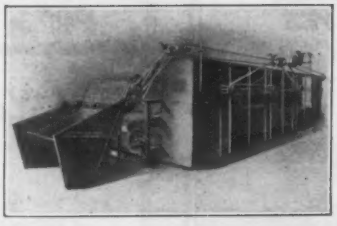
Let us explain more fully the merits of AUTOGYP. Let us help you make your dyeing pay you a profit. Let us show you the many other ways AUTOGYP can be a real money producer for you. Our representative will be glad to call, or a post card will bring full information by return mail.

Write us.

Surpass Chemical Co.
Albany, N. Y.

Dyes and Bleaches — **In One Operation**

"HURRICANE"



AUTOMATIC STOCK DRYER

REDUCE DRYING COSTS

With a "Hurricane" Automatic Stock Dryer

These machines, in many of the leading textile plants in this country and abroad, are saving steam, labor and floor space for their owners. They are producing evenly, thoroughly dried fibers, with which it is possible to produce the best of finished material.

May we describe this process to you more fully?

A "Hurricane" Dryer for every textile need.

The Philadelphia Drying Machinery Co.

Office and Works: 3351 Stokely St. Philadelphia, Pa. Boston Agency: 53 State St.

Tycos

temperature instruments

merit the consideration of every textile maker who is about to reorganize his plant so that it may become a more efficient producing unit. Process efficiency is maintained by installing *Tycos* temperature instruments. *Tycos* can be installed on the following processes:

Bleaching,	Dyeing,	Sizing,
Calendering,	Extracting,	Slashing,
Conditioning,	Finishing,	Soaping,
Crabing,	Filling,	Steaming,
Dampening,	Polishing,	Tentering,
Dressing,	Pressing,	Testing,
Drying,	Scouring,	Washing.

Write and we will send you our General Industrial Catalog.

Taylor Instrument Companies

ROCHESTER N.Y.

There's a Tycos or Taylor Temperature Instrument for Every Purpose

Perfect Insulated Dryers

MILLER SYSTEM

Twenty-Five Years of Successful Operation

Automatic Truck and Tray Type Dryers for all textile fabrics. Drawn Steel frame members uniform in size, not formed by a break. The only dryers carrying 85% Magnesia insulation, which is the highest grade insulation manufactured. All joints between the frame and panels that form the inclosure are air sealed. This improved patented construction is found only in the Miller Dryers.

The story will be told in detail if you are interested.

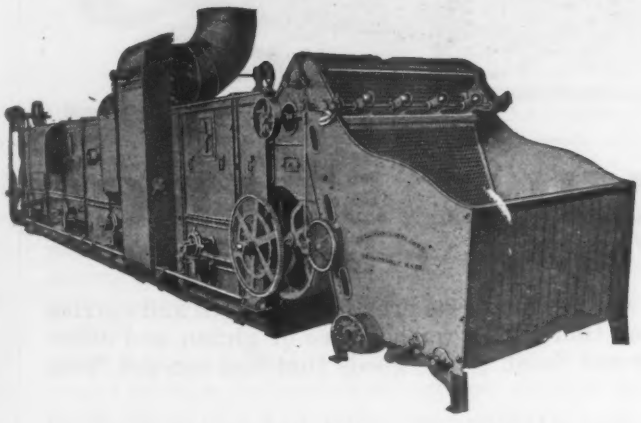
Correspondence Invited

DRYER CORPORATION OF AMERICA

GENERAL OFFICES AND PLANT

Warren, Ohio

Insures A Better Quality Product and a Fair Profit



Is it a problem for you to meet growing competition, increased demand for better quality and maintain at the same time a fair margin of profit? If these things are troubling you, the Sargent Dryer can help you solve your problem.

Capable of a large production, operating at a low consumption of steam and power with minimum of attention, thereby saving in labor, they produce at low cost a clean, soft, bright, thoroughly dried and uniform fiber. In addition to cotton the Sargent Dryers are made for drying wool, hair, linters, flax, silk, etc., also carbonizing.

Booklet on the Sargent Dryer, or any of our other machines gladly sent on request.

C. G. SARGENT'S SONS CORP.
GRANITEVILLE, MASS.
Fred H. White, Southern Agent, Charlotte, N. C.

Sargent Dryers

Sulphurous Acid Generator

Is Your Anti-Chlorinating Method Profitable?

Do you still use the old method of anti-chlorinating with sulphuric acid? The substitution of SULPHUROUS Acid for sulphuric acid will readily show a pronounced saving.

As an anti-chlor, the Sulphurous method is not only more economical, but it eliminates all danger of goods being damaged or tendered on dryer, and assures a uniform, neutral product.

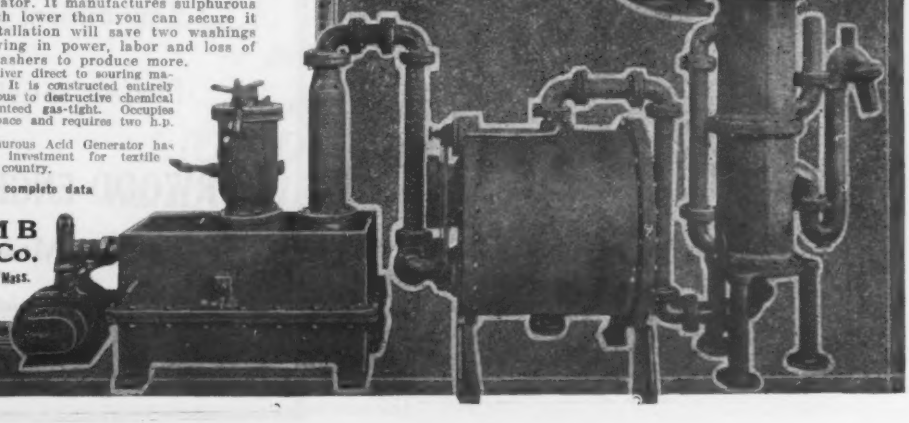
Make your anti-chlor in the form of sulphurous acid, right in your own plant, with the Monaghan Sulphurous Acid Generator. It manufactures sulphurous acid at a cost much lower than you can secure it elsewhere. Its installation will save two washings besides a great saving in power, labor and loss of time, and allows washers to produce more.

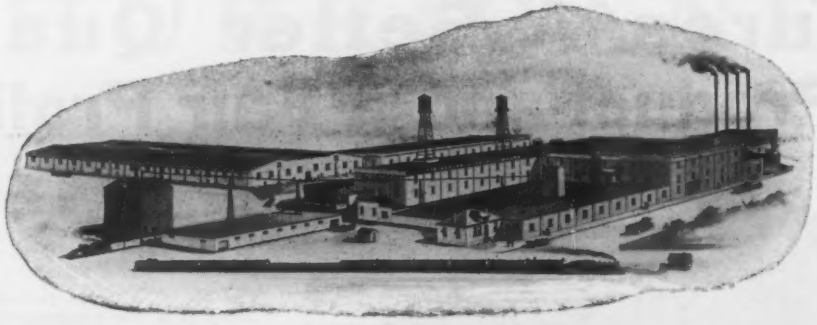
Can be installed to deliver direct to souring machine or storage tank. It is constructed entirely of lead and is impervious to destructive chemical reaction. It is guaranteed gas-tight. Occupies only 36 sq. ft. floor space and requires two h.p. for operation.

The Monaghan Sulphurous Acid Generator has proved a profitable investment for textile mills throughout the country.

Write us for complete data

MACOMB Machine Co.
230 Newton St., Waltham, Mass.





VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

DURABLE K-W UNIVERSALLY USED

KLAUDER - WELDON
DYEING - BLEACHING-SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery, by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the "world's best dyeing, bleaching and finishing machinery."

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W Literature

THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent,
Realty Bldg., Charlotte, N. C.

FILTERS

PRESSURE GRAVITY

Especially designed to meet all requirements of Textile Mills.

Economical in upkeep.

Perfect satisfaction.

NORWOOD ENGINEERING CO.

Florence Mass., U. S. A.

CHAS. M. SETZER, Southern Representative,

Charlotte, N. C.

The Grasselli CHEMICAL CO.

GRASSELLI CHEMICALS ZINC EXPLOSIVES DYESTUFFS

Dyestuff Dept
117 Hudson St.
New York, N.Y.

Factories at
Rensselaer, N. Y.
Grasselli, N. J.

Branch Offices
Boston Providence
Philadelphia Chicago
Charlotte New Orleans
San Francisco

Sole Selling Agents for
ESSEX ANILINE WORKS, INC.
Boston, Mass.

NAPHTHOL A S

—is an important product recently placed on the market by us. Its advantages over Primuline, Developed Scarlet and Vat Reds are becoming well recognized on account of the comparatively simple dyeing methods, and its superior fastness to light, bleaching and washing.

When dyed and coupled with the various fast red and scarlet bases it produces shades which are extremely fast and satisfactory for the highest class of gingham and chambrays.

We also offer a full line of Algol and
Developed Colors manufactured by
FARBENFABRIKEN VORM. FRIED. BAYER & CO.
Leverkusen

Shades matched and quotations furnished promptly.

Established 1815

ARNOLD, HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

All Kinds of
HEAVY CHEMICALS
Sole Agents for
BELLE ALKALI CO.
of Belle, W. Va.
Manufacturers of
LIQUID CHLORINE
BLEACHING POWDER
CAUSTIC SODA
Solid and Flaked

We solicit your inquiry for prompt or future delivery

Rohm & Haas Company Inc.

Manufacturers of

CHEMICALS

PHILADELPHIA, PA. BRISTOL, PA.

SODIUM HYDROSULPHITE—
Sulphoxylates and Allied Products.

LYKOPON—Sodium Hydrosulphite—
For reducing Indigo and vat dyes. Of highest quality and absolutely standard.

FORMOPON—For discharging.

FORMOPON EXTRA—For stripping.

PROTOLIN—For stripping.

INDOPON W—Indigo Discharge Assistant.

TARTAR EMETIC—Technical.

Represented by

The MAKENWORTH COMPANY
Greensboro, North Carolina

Chas. Lennig & Company

Incorporated

40 North Front Street Philadelphia, Pa.
Works: Bridesburg, Philadelphia, Pa.

Manufacturers of

Concentrated Sodium Sulphide
Crystal Sodium Sulphide

Also manufacturers of the following chemicals:

ALUM	GLAUBER SALT
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Iron Free	NITRIC ACID
PAPER MAKERS' ALUM	MURIATIC ACID
WATER FILTRATION ALUM	NITRATE OF LEAD

Represented by

The MAKENWORTH COMPANY
Greensboro, North Carolina

JACQUES WOLF & CO.

PASSAIC, N. J.

Manufacturers of
Chemical Specialties for the Textile Mills

ALIZARINE ASSISTANTS

CREAM SOFTENERS

HYDROSULPHITE

MONOPOLE OIL
Reg. Trade Mark
No. 70991

GUMS
Arabic, Karaya, Tragacanth

Uniform in Application

VICTROLYN

Penetrating, Lubricating, Dependable Assistant in Warp Sizing

KLORASENE

will remove Oil Stains.

If you are troubled, write us.

BOSSON & LANE

Manufacturing Chemists

ATLANTIC, . MASS.

Comparing Results

The mill man who produces a quality product always buys his supplies on a cold business basis. He estimates supplies as he values his employees, not from first cost only, but from the profitable or unprofitable results they produce.

This is the comparison always welcome when judging the use of the special purpose alkalies.

Wyandotte Textile Soda
Wyandotte Concentrated Ash
Wyandotte Kier Boiling Special

Their day to day performance in hundreds of mills proves beyond question that better results in appearance, feel and quality are part of the service they render.

When you realize, too, that these superior results are obtained at no increased cost, your investment proves profitable.

Ask your supply man.

The J. B. FORD CO., Sole Mnfrs.
WYANDOTTE, MICHIGAN

"BRETON" MINEROL "F"

For Cotton Print Goods

"It prevents foaming in the color box"

BORNE, SCRYMSER CO.
Established 1874
80 South Street, NEW YORK
BOSTON PHILADELPHIA
Works: Elizabethport, N. J.

Ciba Co. Inc.

BRANCHES BOSTON PROVIDENCE PHILADELPHIA CHICAGO COLUMBUS, GA.
CEDAR and WASHINGTON STS.
NEW YORK
Ciba Co. Ltd., Montreal, Canada

Sole Representatives
In The United States
for the
Society of Chemical Industry in Basle
Basle, Switzerland

Ciba and Cibanone Colors

A complete line of VAT COLORS

We live up to ideals of service that insure complete satisfaction.

Sole Selling Agents
for
Dow's Indigo and Midland Vat Blues

Satisfaction

IN

Roller, Clearer and Slasher Cloths

Our Roller Cloths are made of the right material with exactly the correct cushion and uniformity of surface to produce the most desirable results.

Clearer Cloth is constructed of high grade material with thick, strong nap that does not pull out and its uniform length is such that the rolls are completely cleared of all short fibre.

Our Slasher Cloth is made of the best material of sufficient cushion and porous to thoroughly force the sizing into the yarn.

In combination with superior quality products is prompt service and right prices.

Let us send you a trial order. Write us.

PHILADELPHIA FELT COMPANY

FRANKFORD, PHILADELPHIA, PA.

Southern Sales Agent: M. C. Sanders, Greenville, S. C.

A World Convention on Business Promotion

One Idea that Brought $20,000 in Sales

A Western merchant attended a great advertising convention, and heard a speaker tell how his firm had increased sales through the establishement of a mail sales department, to serve those who read the newspaper advertisements of the store, but lived at a distance and could not often get to town. The merchant asked some questions, returned home and persuaded his partners to let him establish such a department. The sales of this department, which is operated in the far corner of the top floor of the store, exceed $200,000 a year. Whether you are a member of the Associated Advertising Clubs or not, you may attend the

Nineteenth Annual Convention
ASSOCIATED ADVERTISING CLUBS of the WORLD
Atlantic City, June 3 to 7, 1923

The 5,000 business men and women attending this meeting will be there to exchange experiences and ideas. There will be grist for your mill there. Information and inspiration upon which a bigger, more prosperous business can be established, await you. If you have a dollar and I have a dollar and we trade, we have one dollar each. But if you have an idea and I have an idea, and we trade, then you have two ideas, and I have two. We are both enriched. That's the spirit of these great gatherings, which attract the biggest and best sales promotion brains in the world.

In addition to the sessions of the convention, loaded full of business-building ideas, there will be a great educationad exhibit of advertising. Take a note book with you. You will go back home enriched.

Share with us the joy of June in Atlantic City. What a delightful place it is in that delicious months! Ample hotel accommodations at reasonable, guaranteed rates, admirable transportation facilities, special railroad rates—a great business opportunity and a chance to spend some most enjoyable days at a cost less than the usual expense of going to this Queen of Resorts.

For full information as to special railroad rates, hotels, etc., address

Associated Advertising Clubs
110 West 40th Street, New York, N. Y.

SAVOGRAN

A National Verdict of
"NOTHINGBETTER"
Merits Your Consideration
INDIA ALKALI WORKS
Boston, Mass.

Number 20

RE-FIL-IT TEXTILE SPECIAL

Aluminum Holder Corn Filler

Advantages of the Textile Special

1st. Loose corn from this brush is reduced to a minimum, making the waste more valuable.

2nd. It sweeps cleaner than the regular broom.

3rd. It is much faster than the old method, of sweeping, particularly in the spinning room.

4th. Fanning is unnecessary by this method, and the liability of lint getting into the thread is reduced to the minimum.

5th. Preference for the Textile Special is shown by the sweepers when they realize how much faster and easier it is than the old method.

6th. One holder will outwear many sets of fillers, and the savings in broom cost, during a period of six months or a year is very large.

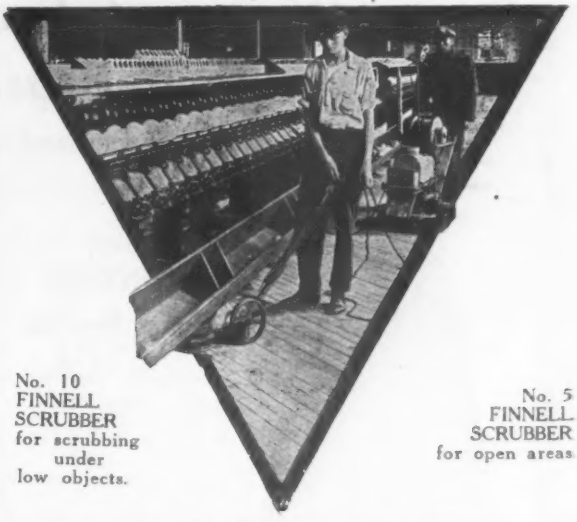
Please write us for prices and full particulars.

Yours for Economy,

RE-FIL-IT BROOM MFG. COMPANY

185 Devonshire Street **Boston, Mass.**

"Clean Floors Reflect Clean Business"



No. 10 FINNELL SCRUBBER for scrubbing under low objects.

No. 5 FINNELL SCRUBBER for open areas

300 GREAT MILLS Have Reduced Waste and Soilage

Three hundred great textile mills were amazed to find that the FINNELL SYSTEM of Electric Scrubbing did more than slash scrubbing expense. They learned that it contributed greater cleanliness to floors and AIR—and kept materials CLEAN.
But even more than that. The example of care and thoroughness which the system set for the workers was reflected in the work of the entire force. Carelessness and waste have been reduced wonderfully, saving huge sums of money.

CLEAN FLOORS

Pay Big Dividends

CLEAN FLOORS pay enormous dividends through the following benefits: (1) saving of labor. (2) better working conditions; (3) cleaner production; (4) fewer accidents; (5) healthier, happier employees; and (6) better light and air.

Any mill can enjoy these advantages for there is a profitable size outfit for any size mill.

Write Today for Proof

Send for booklet "Electrical Scrubbing" and large broadside with complete information on the dividend paying Finnell System.

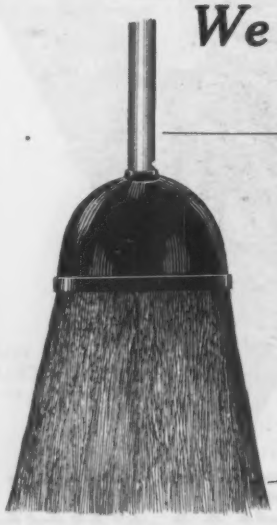
AMERICAN SCRUBBING EQUIPMENT SALES CO.

General Offices and Factories
55 N. Collier St.,
HANNIBAL MO.
District Offices in Principal Cities

"Clean Floors Reflect Clean Business"

Every Way and Every Day
We are Brushing Better and Better

From 1st hand is what you want. — MR. BUYER



Fibre WONDER Duty Broom

Reliable, Resilient, Tough. Made Right — Priced Right.

For General Factory, Mills, etc.

WONDER Floor Brush and Sweeper

Reduce your cleaning expense one-half. Patented handle and Clamp combination. Built to wear, contains no pitch or glue.

Guaranteed. Stands all weather conditions.

We are Manufacturers Not jobbers or assemblers

Write for Samples

Brooms and Brushes that are made for service

H. WONDERLICH CO., 2814 N. 4th St., PHILADELPHIA

THE "Southwestern" Iron Clad
Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT! PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through all principal distributors.

The Southwestern Broom Mfg. Co.
Evansville, Indiana

AMERICAN SUPPLY COMPANY
PROVIDENCE, R. I.

Manufacturers of

LOOM HARNESS,
WEAVING REEDS,
OAK TANNED LEATHER
BELTING, STRAPPING,
ETC.

We make a specialty of Harness for Warp Drawing Machines

BRUSHES within themselves are of no value to you. They render a service only when they are put into action to increase production. The amount of service is estimated by the amount of the increase of production made possible by their use.

How then, are you to judge the worth of a brush? Simply by this method. A good textile brush is built to promote production, through cleanliness, with the least possible effort and time on the part of the employees who use it.

The quality and workmanship in the brush itself needs no comment. When you buy Perkins Practical Brush that is guaranteed.

ATLANTA BRUSH CO.

ATLANTA, GA.

ATLANTA BRUSH COMPANY

A Brush for every Textile Need

Multiply your ideas *of* Fibre Service by three

WE have such confidence in Vul-Cot Fibre that we guarantee it to be free from impurities. We know that Vul-Cot Fibre is good fibre. From the selection of the rag stock to the completion of the finished tubes and sheets we have had its production under our own supervision.

You can drill Vul-Cot

on the same machines and with the same drills as are used for metal. The drill cuts clean. Even in drilling holes close together you will find that the thin dividing wall is almost as solid and firm as steel.

You can stamp Vul-Cot

Nearly everything that can be stamped out of metal can be stamped out of Vul-Cot. Here again the same machines that were used for metal will serve.

You can thread Vul-Cot

as easily as wood or metal—making it the ideal material for threading the various kinds of connections where high-grade insulating material is required.

You can turn Vul-Cot

much more easily than steel and with far better results than wood. Vul-Cot can be turned with an accuracy as fine as 5/1000 of an inch.

Three huge factories manufacture Vul-Cot Fibre and Vul-Cot Fibre parts—with three times ordinary facilities for speedy production and delivery. Let us confer with you about the use of Vul-Cot Fibre in your business.

National
Vulcanized Fibre Company
Wilmington, Del.

THE BELGER CO., BOSTON, MASS.

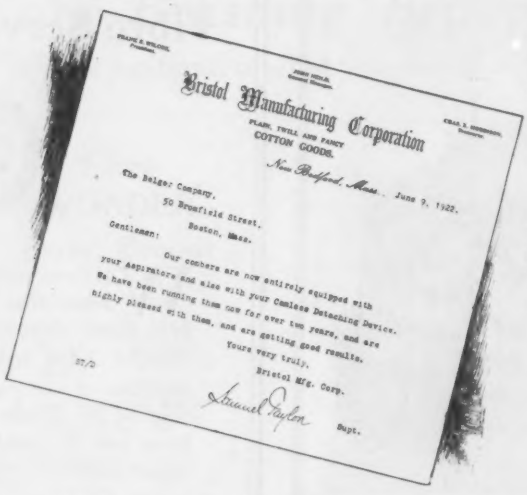
FORMERLY J. WEINBRENNER & CO.

Roth's Pat. Improved
ASPIRATORS
and Roll Waste Packers
for ALL MAKES OF
COMBERS

BETTER COMBED and
CLEANER SLIVER

SAVINGS in
WAGES,
HALF LAPS
AND BRUSHES.

WASTE of same good quality as with old doffer arrangement.



Bristol Manufacturing Corporation
PLAIN, TWILL AND FANCY
COTTON GOODS.
New Bedford, Mass., June 9, 1922.

The Belger Company,
50 Brownfield Street,
Boston, Mass.

Gentlemen:

Our combers are now entirely equipped with your Aspirators and also with your Camless Detaching Device. We have been running them now for over two years, and are highly pleased with them, and are getting good results.

Yours very truly,
Bristol Mfg. Corp.
Supt.

PATENTED CAMLESS
DETACHING MOTION
for NASMITH Combers.

INCREASED
PRODUCTION

with same good quality of combed sliver for which the Nasmith comber is so well known.

LESS POWER,

SIMPLIFIED
SETTINGS and
ADJUSTMENTS.

WASTE is drawn direct from brush to perforated cylinder.

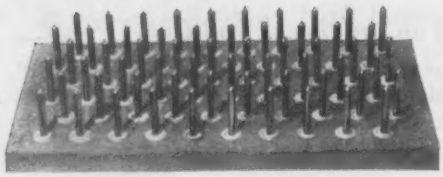
WASTE delivered separately for each comber head.

NOISELESS WORKING—
This mechanism replaces the big cam, the quadrant and pinion, clutch, clutch operating cam and lever of the present machine.

ALSO IMPORTERS OF TURKEY RED YARNS FAST TO BLEACHING

KORE-LOKT PIN BOARDS

REG. U. S. PAT. OFFICE



Patent Rights Pending

Are You Responsible

for good weaving in your mill? If so, you should know Kore-Lokt Pin Boards and the story of their usefulness in modern loom equipment.

Expert Opinion from men in charge of the weave rooms in prominent mills is available to superintendents and overseers upon request.

Send for this information so you may know the merits of Washburn Kore-Lokt Pin Boards as an improvement over old style Filling Boxes. Learn how the other fellow checks up results from the "Build of Bobbins."

WASHBURN
IF IT'S ROLLS, WE MAKE THEM

NEW BEDFORD, MASS.

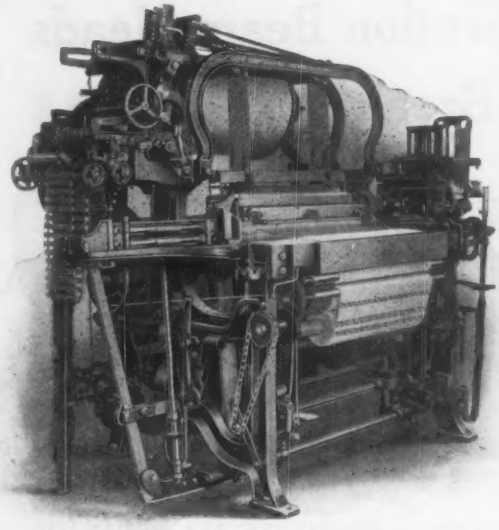
PERFECTION SHELL ROLLS

MFD. BY WASHBURN
NEW BEDFORD MASS

FOR
BLEACHERIES
BALL WARPING
FINISHING PLANTS
CORD FABRIC SHIPMENTS

WASHBURN
IF IT'S ROLLS, WE MAKE THEM

NEW BEDFORD, MASS.



AUTOMATIC TERRY TOWEL LOOM

Built for Under Cam,
Jacquard
or
Dobby Harness Motion

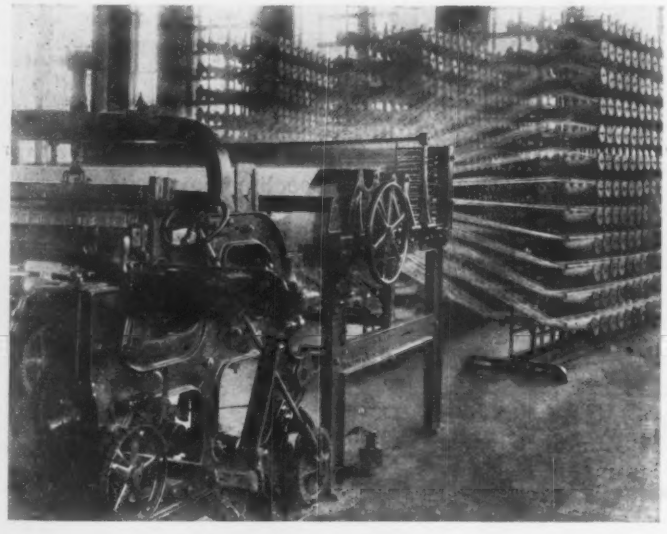
CROMPTON & KNOWLES LOOM WORKS

WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.
ALEXANDER & GARSED, CHARLOTTE, N. C.
Southern Representatives

SPECIALISTS IN SPOOLING AND BEAMING MACHINERY

WOOL, WORSTED, COTTON, JUTE, ETC.



WEAVING-DIRECT OUTFIT for cord, and special fabrics.

WARPER CREEL and TENSION DRESSER, shown in connection with the loom for weaving cord fabric.

WARPER CREEL built in stationary and heavy base models.

Standard spacing 6" x 6½" for maximum 5" x 8" spools or tubes. Special spacing to mills' requirements.

UNIFORM TENSION from WARPER CREEL to loom.

Highest efficiency test in your goods. PRODUCTION plus QUALITY.

WARP COMPRESSING MACHINE CO. Worcester, Mass. U. S. A.

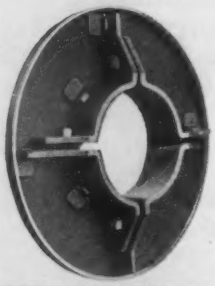
Representative: F. W. KIESSLING, *Worcester, Mass.*

All Steel Loom and Section Beam Heads

Cannot Break
Do not Bend

"ALL STEEL" LOOM BEAM HEAD
"MALLEABLE" GEAR
Patent Pending

"ALL STEEL" SECTION BEAM HEAD
PATENTED



"ALL STEEL" ADJUSTABLE HEAD
SPLIT OR SOLID TYPE
PATENT PENDING

DUPLICATE YOUR CAST IRON HEAD IN STEEL — ELIMINATE ALL BREAKAGE
MAKE YOUR BEAM HEAD INVESTMENT PERMANENT

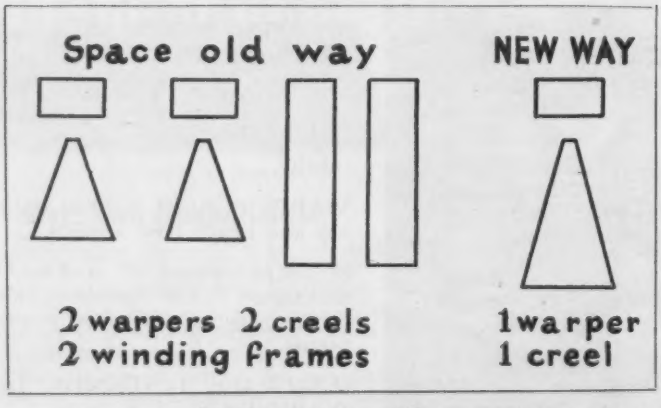
Mossberg Pressed Steel Corporation

Attleboro, Mass.

SOUTHERN OFFICE 201 AUGUSTA ST. GREENVILLE, S. C.

NEW AUTOMATIC CREEL

for direct warping from FILLING WOUND BOBBINS



COMPLETELY ELIMINATES the

Spooling of the yarn

Spooling waste

Undue and irregular tension of yarn due to spooling

Stoppage for doffing

Doffing is done while warper is running.
Greater production from better warps at lower cost.
Better loomage from auto-creel warps because
Elasticity is preserved in yarn.

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4 FACTORS
Men
Money
Material
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HEART OF THE LOOM

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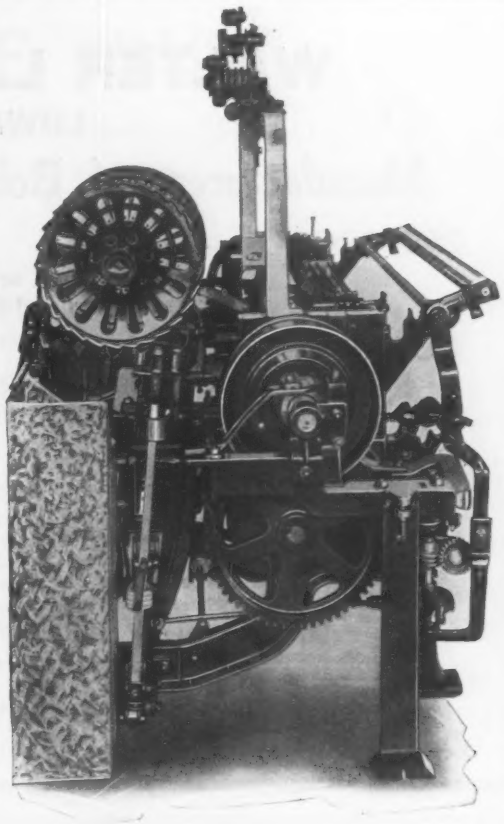

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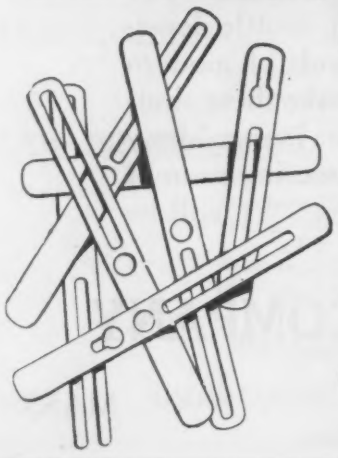

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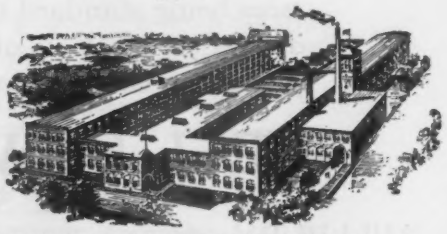

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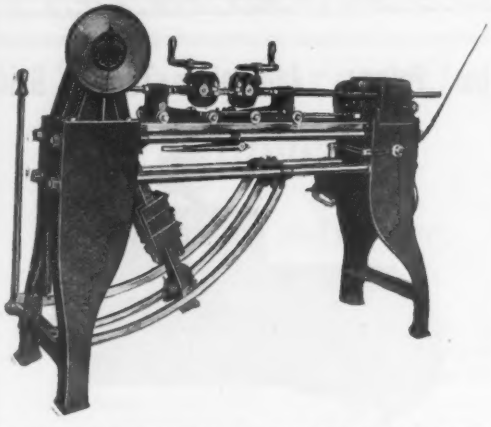
All tests for breaking strength shall be made on an approved type of inclination balance breaking machine. The maximum capacity of the machine shall be 800 pounds.

The 1 in. x 1 in. x 3 in. grab method of testing shall be used, defined as follows: The lower half of each pair of jaws shall be 2 inches or more in width, and the upper half shall be 1 inch in width. Jaws shall be planed smooth and flat, with edges slightly rounded to prevent cutting. The initial length of the test pieces between the jaws of the testing machine shall be 3 inches, and the pulling jaw shall travel at a uniform rate of 12 inches per minute.



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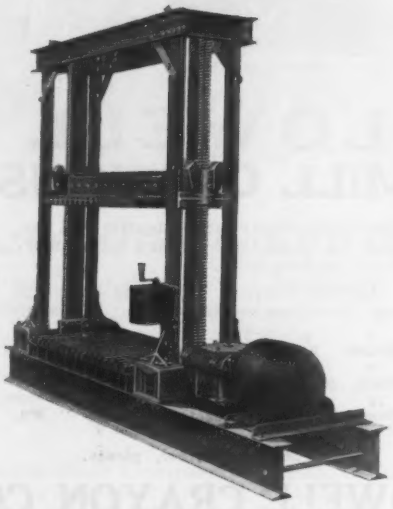

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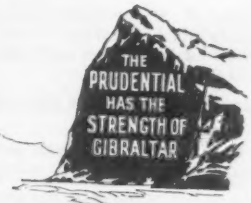

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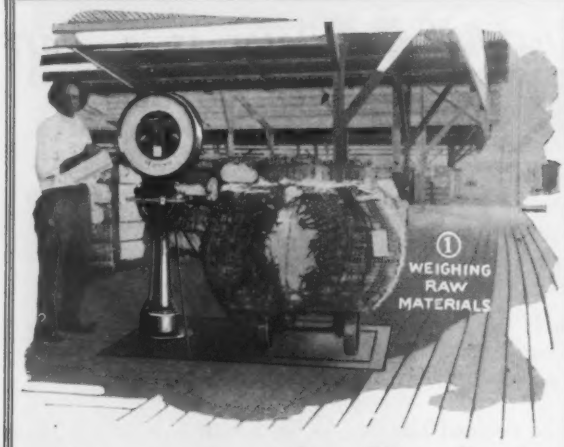

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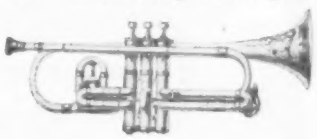

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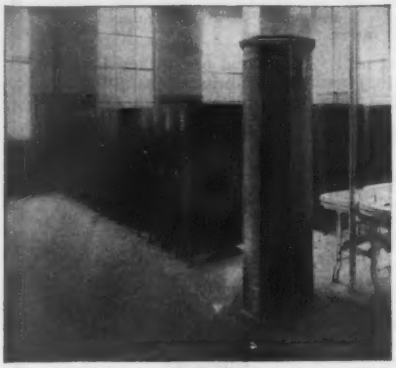

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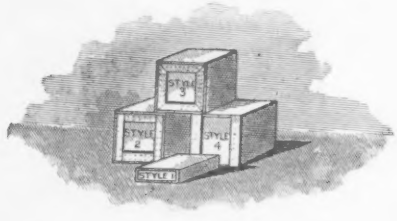

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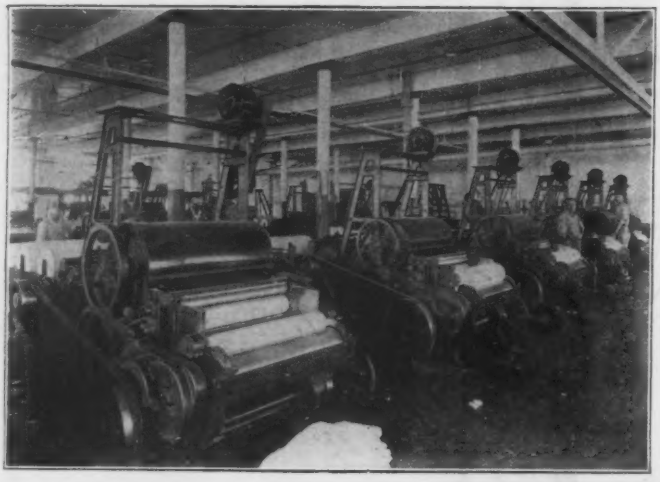

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Over two million happy spindles are driven or lighted by H. & G. installations, all of which are just as dependable today as the day they were installed.
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INC.
GREENVILLE, S. C.
HUNTINGTON & GUERRY
TROUBLE PROOF
ELECTRICAL INSTALLATIONS
H & G TROUBLE-PROOF
ELECTRICAL INSTALLATIONS

Best for the Southern Climate

Over thirty years ago the Cooledge chemists began working on formulae for an outside house paint which would best withstand the Southern climate, a paint that would wear longer and hold its original color. After years of tests these formulae have been perfected.

PROVE IT YOURSELF

Cooledge Hygrade Mill Cottage Paints are the most economical paints you can buy. The best way (though it takes a long time) to convince yourself of this fact is to paint half of the mill cottages with one paint and the other half with Cooledge Hygrade. Long after the other paint had faded, cracked and peeled, Cooledge Hygrade will be giving perfect service.

The REASON

The reason is simply this: Cooledge Hygrade Mill Cottage Paints are made **especially for the Southern climate** from formulae perfected after years of experiments and tests. Yet Cooledge Hygrade costs no more than ordinary paints.

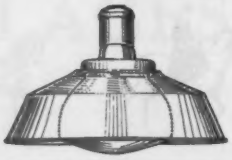
Write us today for special quotations on 500 gallons, 1000 gallons and up. Also ask for prices on our shingle stains.

We will make paint exactly according to your engineer's specifications if you prefer, but we strongly advise the use of our own formulae.

COOLEDGE CH HYGRADE
Paints and Varnishes

Manufactured Exclusively by
F. J. COOLEDGE & SONS
ATLANTA
CHARLOTTE SAVANNAH TAMPA

Industrial Lighting



The Glassteel Diffuser Equipped With a Cast-Aluminum Holder

We are rendering textile mills all over the Southeast prompt and efficient service, supplying not only the most efficient and effective systems of illumination particularly suited to every textile mill use, but any type of Edison Mazda Lamp desired.

Whatever your electrical requirement, be it illuminating units, lamps, motors, wiring or what not, you will find Carter Electric Service more satisfactory and prompt.

COMPLETE LINES OF

Wire
Conduit
Switches
Safety Devices
Fuses
Insulators
Lamps
Lighting Units
Fixtures
Fans
Street Lights
Motors
Brushes
Etc.
Anything Electrical

QUICK DELIVERY

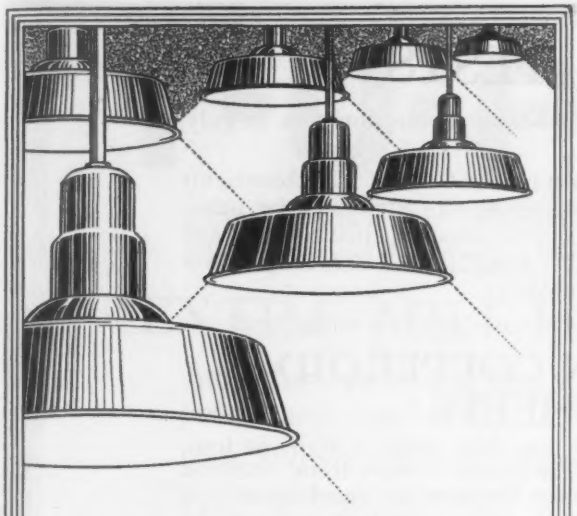
CARTER ELECTRIC CO.
Distributors
ATLANTA SAVANNAH

Picker Eveners

that are sluggish will not make a uniform lap. Covering cones with leather or some other covering will not cure the trouble.

Ball bearings will. They eliminate the friction that causes the slip of the belt. We make complete ball bearing equipments for eveners and aprons.

ALDRICH MACHINE
Ball WORKS Bearings
Greenwood, S. C.



Illumination "Machines"

Have You Enough— and the Right Kind?

A machine takes raw material and turns out finished product. That is just what IVANHOE R L M reflectors do. They take the raw light of MAZDA lamps and turn it into *illumination.*

Raw light is more harmful to the human system than raw food. It is *unfit* for consumption. It slows up work and ruins eyes. Raw light only *partly* manufactured into real lighting is little better!

If your lighting equipment is out-of-date or unsuited to your needs you are keeping production down, suffering undue spoilage, breaking down employee morale, increasing the accident hazard and making sanitation difficult. *Read that again—slowly.*

Near you is an IVANHOE distributor trained in the lighting requirements of mills like yours. Why not get the benefit of his advice since it involves no obligation! If you don't know who he is, write us. Today is better than tomorrow.

IVANHOE-REGENT WORKS
of General Electric Company
Cleveland, Ohio

IVANHOE

GLASS SHADES—STEEL REFLECTORS

YOU!

Mr. Mill Man, Should Investigate

Zemco-lite

TRADE MARK

"The Cement Paint"

ZEMCO-LITE the CEMENT Paint is the Whitest of Whites. When put on the walls and ceilings of your mill, you may rest assured that it will retain its original whiteness indefinitely. Does not turn yellow or take on that dull flabby color common to ordinary paints.

When buying ZEMCO-LITE you are assured of permanence. ZEMCO-LITE *stays* on the walls and ceilings. Does not peel, flake, chip or crack. Is impervious to steam, acid fumes, water, etc.

When economy is considered, ZEMCO-LITE takes the lead. With its base of pure white Portland Cement, mixed with water, you save the excessive cost of linseed oil or other oil bases used in paints. And, ZEMCO-LITE—"just like cement" improves with age.

Also a complete line of paints for exterior painting of mill, mill village—for wood, iron, brick, stone, stucco, etc.—and all made with Portland Cement.

It will pay you to investigate ZEMCO-LITE if you are not already using it. Let us hear from you.

American Cement Paint Co.
Chattanooga, Tenn.

CEMENT FOR PERMANENCE—
WHY NOT "ZEMCO- LITE?"

ABOUT TESTS

Tests are like advertising claims—their value depends largely on who makes them.

For that reason, the results shown by the tests of The American Society for Testing Materials, in which sheets furnished by practically all American manufacturers were exposed, just as they are in actual service, furnish the only impartial and conclusive evidence available as to relative durability.

These tests have proven beyond the question of a doubt that

YOUNGSTOWN COPPEROID STEEL SHEETS

resist corrosion in a far greater degree than those made of Wrought Iron, Bessemer Steel, Open-hearth Steel, or the so-called "Pure Irons" made in open-hearth steel furnaces and sold under the name of "ingot irons."

Users of sheets should investigate this subject, which they can do by reference to the data on the tests mentioned as published by the American Society for Testing Materials. We will be glad to supply this information on request.

The Youngstown Sheet & Tube Company

Youngstown, Ohio

District Sales Offices

BOSTON—120 Franklin St.
NEW YORK—30 Church St.
PHILADELPHIA—Pennsylvania Bldg.
ATLANTA—Healey Bldg.
PITTSBURGH—Oliver Bldg.
CLEVELAND—1038-1040 Hanna Bldg.
DETROIT—2021-2022 First Nat'l Bank Bldg.
CHICAGO—McCormick Bldg.
ST. LOUIS—1139 Olive St.
DENVER—First Nat'l Bank Bldg.
DALLAS—1401-2 Magnolia Bldg.
SAN FRANCISCO—604 Mission St.
SEATTLE—Central Bldg.

VOGEL PATENTED

FROST PROOF CLOSETS

They require no pit.

They save water.

All bowls have enameled rims. In service daily, winter and summer.

No. 1

OVER 350,000

Giving

Satisfaction in

All Climates

The ideal water closets for Factories and Mill Villages, where thousands have been installed.

The most durable water closets made — excepting none.

Every Fixture Tested Under Hydraulic Pressure Before Leaving Factory.

INSIST ON GETTING THE VOGEL

Ask your jobber

JOSEPH A. VOGEL CO.

Factory and Office at

WILMINGTON, DEL.

VOGEL PATENTED

No. 5 FACTORY CLOSET

This fixture fills the demand for a strong and durable automatic water saving closet outfit for factory use. The valve device is extremely simple and repairs, though seldom necessary, can be made by removing the valve cap back of bowl.

T-U-P-E-L-O

is a species of lumber that might well be said to be "grown to order" for

TEXTILE MILL FLOORS, PLATFORMS,

and other places and uses where "wear and tear" must be expected and provided for. *Leave it to TUPELO!*

This Softwood Hardwood has an "involved" grain which keeps it from slivering or splintering. A TUPELO floor wears smooth because it wears little—always looks well, because TUPELO has a fine, white color and a satiny sheen.

We'll gladly tell you the whole, interesting story of TUPELO if you'll write and say "we're listening." When? TODAY?

SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

805 Poydras Building, New Orleans, La., or 805 Graham Building, Jacksonville, Fla.

(Please address the office nearest you)

CONCRETE — DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN. — PERMANENT

MR. TAXPAYER—YOU!

Do you want your country to spend YOUR good money on roads that will wear out before your bonded indebtedness is liquidated?

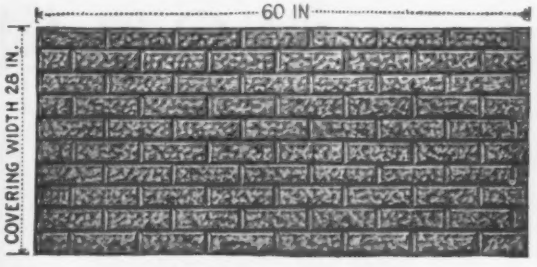
I SAY YOU DON'T.

What you want is a hard-surfaced road, with little cost for maintenance—a road that can be traveled in rain or snow, summer and winter. You want a PERMANENT road—that means CONCRETE!

Write for Literature—It's Free

DIXIE PORTLAND CEMENT CO.

CHATTANOOGA, TENN.



STEEL SIDING

The style shown above is our Pressed Brick Siding, painted and galvanized No. 24 Gauge or lighter. 8-6/10 sheets per square. Pattern is exact size pressed brick, 2⅝ x 8½"

We also manufacture other styles in standard sizes—corrugated, pattern and v-crimp, lengths up to 12 feet.

Skilled engineers and architects are at the service of Southern mills ready to work out your plans and make valuable suggestions in the use of any one of our products, which include:

DIXIE VENTILATORS	AND FITTINGS	ROLLS AND RIDGE
PORTABLE ALL-STEEL GARAGES	GALVANIZED WALL TIES AND PLUGS	ROLLS GALVANIZED TANKS
SLIDING FIRE-PROOF DOORS	GALVANIZED METAL SHINGLES	METAL CEILINGS METAL CORNICES
METAL FRAME WIRE GLASS WINDOWS	GALVANIZED CORRUGATED SIDING	METAL SKYLIGHTS COMPOSITION ROOFING
UNDERWRITERS TIN CLAD DOORS AND SHUTTERS	GALVANIZED ROOFING GALVANIZED PRESSED BRICK SIDING	SLATE ROOFING ASPHALT SHINGLES
GALVANIZED GUTTERS AND FITTINGS	GALVANIZED CORRUGATED SHEETS	BLOW PIPES SMOKE STACKS
GALVANIZED PIPE	GALVANIZED VALLEY	ETC., ETC.

The prices are right—The service is prompt. Your satisfaction is assured on any order, large or small. Catalogs sent gladly on request

Bowman-Dozier Mfg. Co.

Manufacturers—Contractors—Sheet Metal Products

ATLANTA, GA., U. S. A.

The Quickest and Easiest Way to Lace Belts

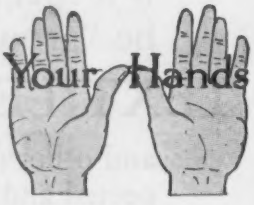
Bristol's Patent Steel Belt Lacing

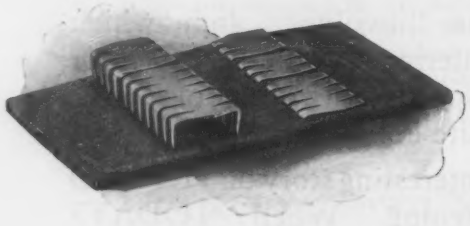
Almost as Simple as Driving a Nail

A Hammer

A Piece of Soft Wood

Your Hands





It makes a good joint, too.

—Doesn't cost much to have a few boxes on hand.

They will save you dollars in time gained, which would otherwise be lost by slower methods of belt lacing.

Did you get a copy of Bulletin 713-J?

THE BRISTOL COMPANY : WATERBURY, CONN.

Boston New York Philadelphia Pittsburgh Detroit
Chicago St. Louis San Francisco

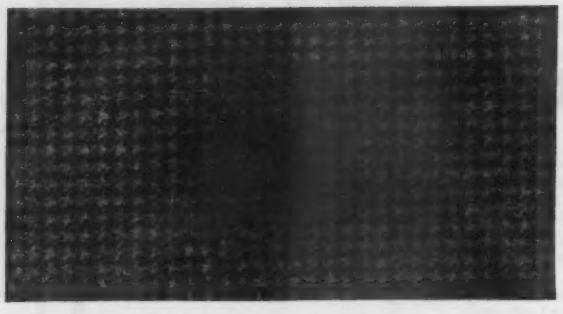
Stained Goods!

Hot Bearings mean short life.

Bearings are expensive.

Oil running out of bearings means dirty floors and machinery. RESULTS! WASTED MATERIAL FROM STAINED GOODS.

STAYSWELL laughs at drips and spatters.



STAINED GOODS ARE EASY TO AVOID BY USING THE SNOW-WHITE STAINLESS GRADES OF STAYSWELL

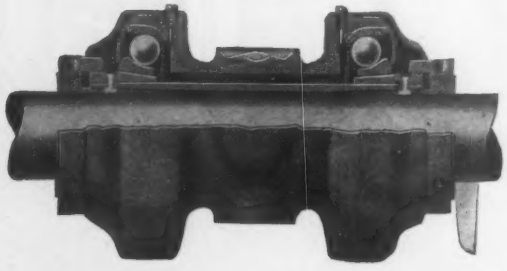
STAYSWELL "STAYS PUT" on the hottest bearing, eliminating all friction.

Let us quote you on your requirements.

LAMSON OIL CO., Inc.
10 Dorrance St. Wharf
PROVIDENCE, R. I.

Are you interested enough to have it proven?

MANUFACTURERS OF
Chapman BALL BEARINGS
"You Pay for them Whether You Buy them or Not"



State your case. We will give you evidence.

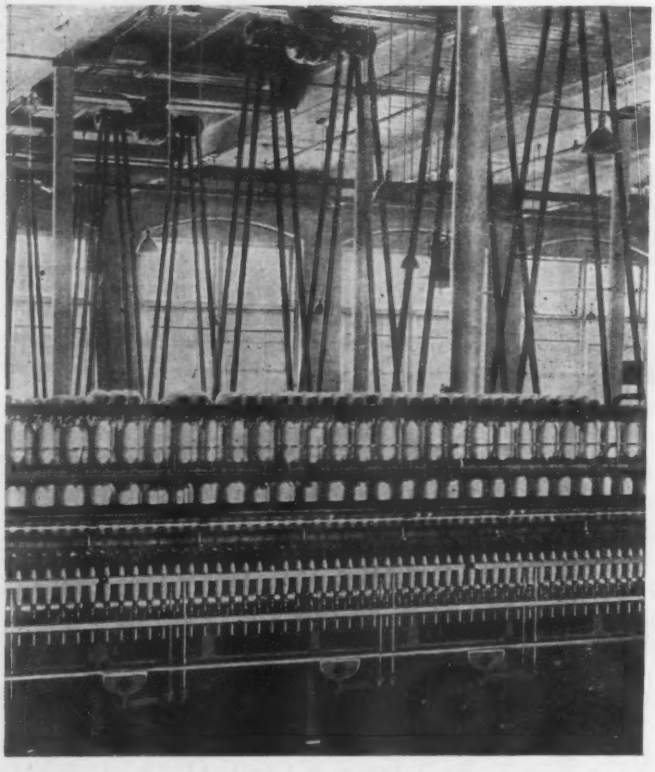
Would you take the money—if we put it in your hand?

A sum equivalent to 15% or more of your yearly power costs—would it be very much?

Chapman Ball Bearings—instead of the old style babbitted or bushed bearings—on your lineshafts will save this amount for you each year—and will continue to do so ***for a whole lifetime.***

THE TRANSMISSION BALL BEARING CO., INC.
ELIMINATORS OF BEARING TROUBLES

1050 MILITARY RD. BUFFALO, N. Y.



Where Belt Service Means Production

A four frame group drive is one of the most efficient types in the modern spinning room equipment; but it must have the *right* belts. The Graton & Knight Manufacturing Company make leather belts *for this drive* that will guarantee you production.

Our engineers will be very glad to give you the benefit of their experience in this important work.

The Graton & Knight Mfg. Co.

Oak Leather Tanners, Makers of Leather Belts and other Leather Products

Worcester, Mass., U. S. A.

THE JOHNSON FRICTION CLUTCH

As Used on the
WERNER DYE JIGGERS

Equip Your Dye Jiggers the "JOHNSON WAY" Double Clutch Exterior

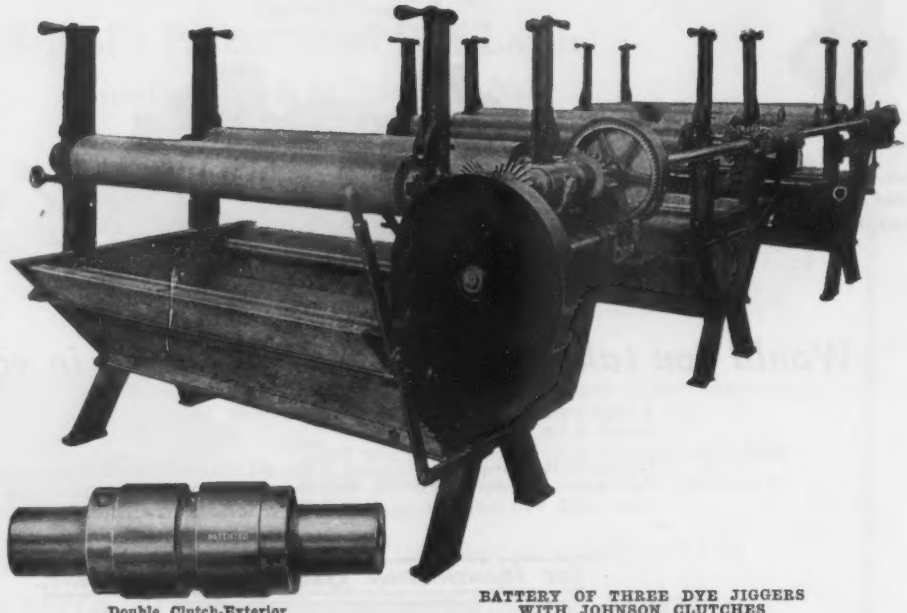
A No. 4 Double Clutch is used on the end of each machine to operate the rolls either way through bevel gears mounted on hubs.

For textile machinery it is very essential that a reliable and powerful clutch be used so that the machine will always be working at its maximum capacity and thereby be efficient in output.

The Johnson Clutch has been tried by the leading textile machine manufacturers and adopted on its merit for many machines. The most of these machines are of special design for a particular purpose and therefore cannot be given publicity.

Let us work out your problems.

Write for Catalog "G."

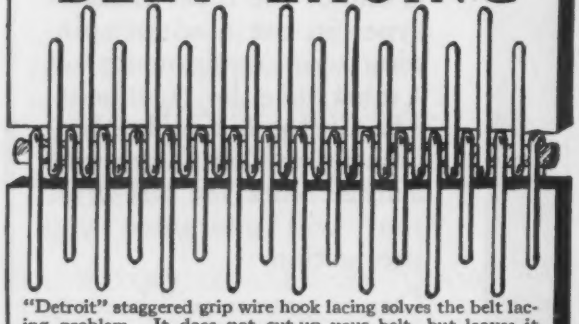


Double Clutch-Exterior

BATTERY OF THREE DYE JIGGERS WITH JOHNSON CLUTCHES
Courtesy of, Werner & Co., Inc., Passaic, N. J.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

Belt Lacing Made Easy
"DETROIT"
BELT LACING



"Detroit" staggered grip wire hook lacing solves the belt lacing problem. It does not cut up your belt, but leaves it stronger than any lacing in existence. Each "Detroit" hook has a pulling strength of over 100 lbs. It is very flexible, works perfectly in bad places where no other lacing will give service. It is very easy to apply. Saves belts. Saves time. Saves money. Gets the best out of power used. Costs only 1c an inch.

WRITE FOR FREE SAMPLE.

Detroit Belt Lacer Co., Detroit, Mich.

Branch offices in large cities

Bull Dog Lacer Co., Hamilton, Ont., Can. Nicholson Clipper Co., Manchester, Eng.

BETTER **NON-FLUID OIL** LUBRICATION

Counterfeit Money May Look Good—
but it isn't made of the right stuff.

Imperfect lubrication of substitute lubricants causes you trouble and costs the mill more money.

Insist on genuine

TRADE MARK REGISTERED IN
NON-FLUID OIL
UNITED STATES PATENT OFFICE

MODERN TEXTILE LUBRICANTS

NON-FLUID OIL stays in bearings giving perfect and positive lubrication—lasts longer per application—and costs less per month, at the same time avoiding oil stains because of its adhesiveness.

Try it for yourself, testing sample free on request.

New York & New Jersey Lubricant Co.

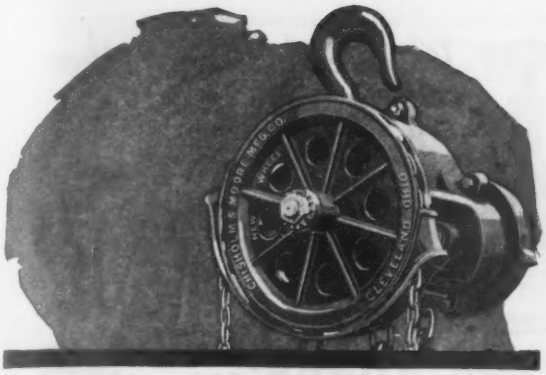
401 Broadway New York

Southern Agent, L. W. Thomason, Charlotte, N. C.

Ample Stocks at Our Branches

Charlotte, N. C. Greenville, S. C.
Atlanta, Ga. New Orleans, La.

AT LESS COST PER MONTH



CYCLONE HOISTS
HIGH SPEED

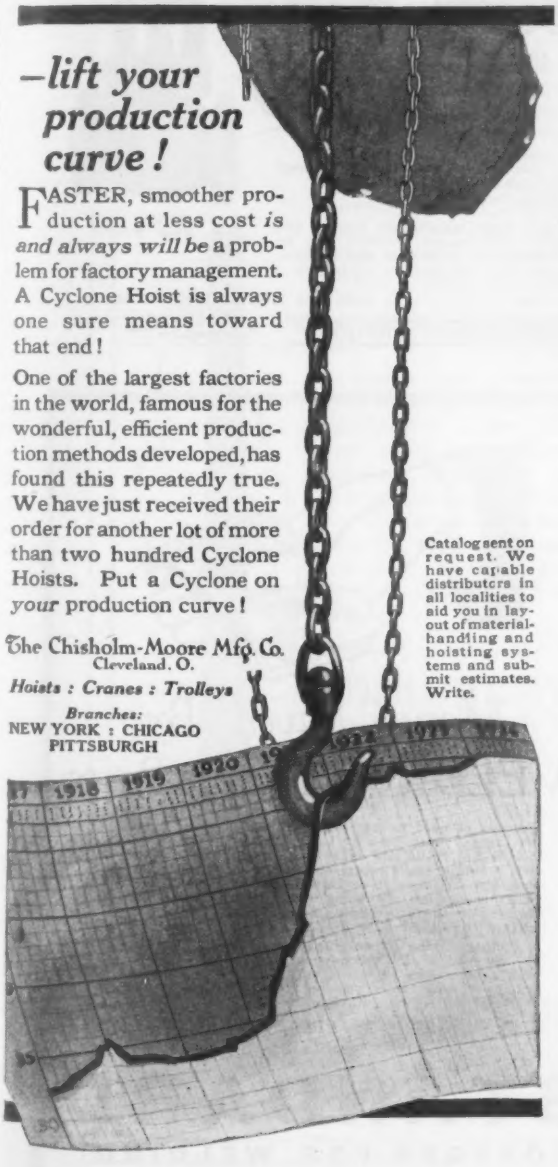
—lift your production curve!

FASTER, smoother production at less cost *is and always will be* a problem for factory management. A Cyclone Hoist is always one sure means toward that end!

One of the largest factories in the world, famous for the wonderful, efficient production methods developed, has found this repeatedly true. We have just received their order for another lot of more than two hundred Cyclone Hoists. Put a Cyclone on *your* production curve!

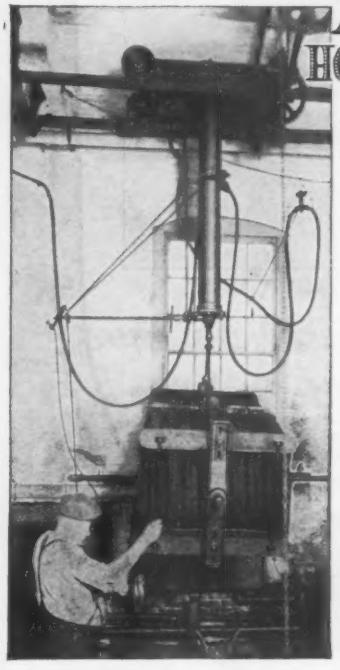
The Chisholm-Moore Mfg. Co.
Cleveland, O.
Hoists : Cranes : Trolleys
Branches:
NEW YORK : CHICAGO
PITTSBURGH

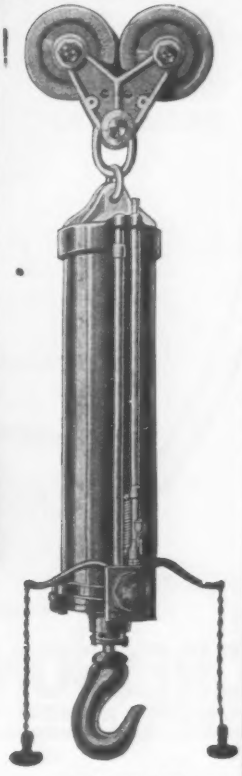
Catalog sent on request. We have capable distributors in all localities to aid you in layout of material-handling and hoisting systems and submit estimates. Write.



CURTIS

AIR HOISTS





Used in The Textile Industry

"Lift it with air"

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

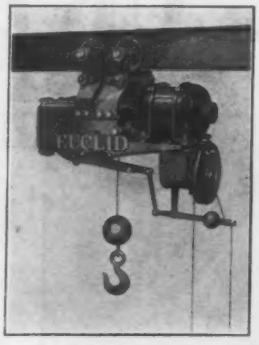
Curtis Pneumatic Machinery Co.
1571 Kienlin Ave. St. Louis, Mo.
Branch Office
532-R Hudson Terminal New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
C.P.M.M.Co.

Established 1854

Reduce Handling Costs!

THE QUICKEST AND EASIEST WAY



is with a hoist—the work of ten men can be done in less time. And the most efficient hoist is an electric hoist—and the most efficient and dependable electric hoist is a EUCLID.

Let us send you interesting catalogs telling the advantages of electric hoists and showing the sizes and types for every mill use, large or small.

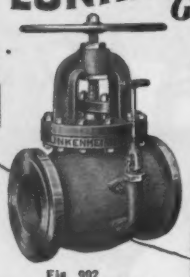
EUCLID CRANE & HOIST CO.
EUCLID, OHIO

ELECTRIC EUCLID HOISTS

You need look no farther

Small or large, for low or high pressures or temperatures, of Bronze, Iron Body Bronze Mounted, Steel Monel Mounted, or of All Iron for handling fluids which attack bronze alloys, a design particularly adapted for the purpose can be found in the comprehensive line of

LUNKENHEIMER Globe and Angle Valves



The completeness of the line makes possible standardizing on Lunkenheimer Valves with that resultant prolonged satisfactory service and economy of maintenance provided only by the Lunkenheimer method of manufacture.

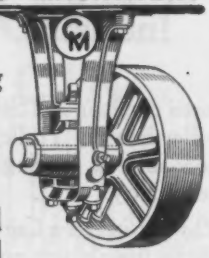
For complete information write for a copy of Catalog 58-AK.

1300-22-10

THE LUNKENHEIMER CO.

"America's Best since 1862"

CRESSON-MORRIS
POWER TRANSMITTING MACHINERY



Power transmitting machinery
Shafting
Rope transmission
Machine moulded and cut iron and steel gears for heavy service.
Complete plant equipment.
Engineers; founders; machinists.
Sugar centrifugals.

CRESSON-MORRIS CO.

18th Street and Allegheny Ave.
PHILADELPHIA, PENNSYLVANIA

2188-X

Sixty Years Experience as Engineers-Founders-Machinists

Money Saved By WELDING Broken Parts

There is no need to send valuable machinery or parts to the scrap heap when broken, while STANDARD WELDING SERVICE is at your command. Not only does welding make worn or broken parts as good as new, but it makes them better and stronger.

Great economies are being effected in mills all over the country through welding with STANDARD OXYGEN AND SUPPLIES.

A further saving in welding operation can be effected by the use of PURE oxygen. Standard Oxygen is 99.5% pure—the best that money can buy.

Let us consult with you on your welding problems. A postal will bring full details.

STANDARD GAS PRODUCTS CO., INC.
ATLANTA, GA.

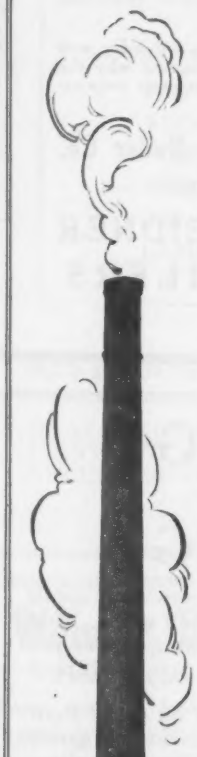
STANDARD
OXYGEN FOR WELDING

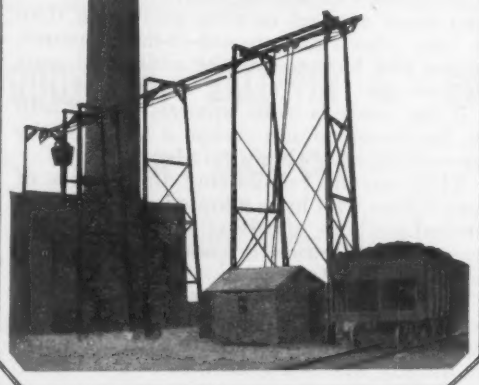
From Car To Boiler Room For Five Cents

THAT'S what it costs to handle your coal with the Godfrey Conveyor—from five to seven cents a ton—depending on the distance carried, and it only takes an hour and a half to unload a fifty-ton car.

Just a glance at the accompanying photograph will show you how simple and yet how efficient is the operation of the Godfrey. The coal flows from the car, through a narrow steel track chute, into the conveyor bucket and is then transferred to bins, boiler room or outside storage. One man, stationed in the hoist house, controls the entire operation.

Whether your power plant is parallel with or at right angles to the railroad siding makes no difference. There is a Godfrey Conveyor to serve the requirements of every industrial firm, both large and small. Write for descriptive literature and prices.





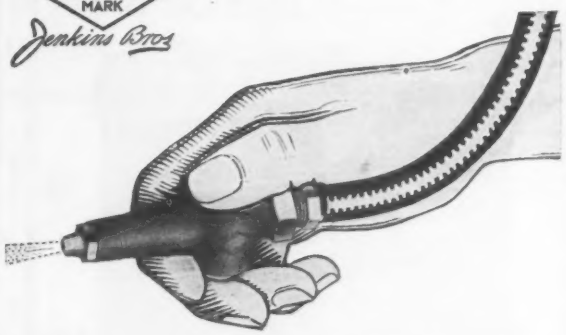
Ask for Catalog Z

GODFREY CONVEYOR COMPANY
Elkhart, Indiana, U. S. A.

Made for maximum service not merely the average

TRADE JENKINS MARK

Jenkins Bros



Users of Compressed Air! try this waste-proof air gun for cleaning

The Jenkins Air Gun does not waste air, because air cannot leak around the seat when the valve is not in use.

The Jenkins Renewable Disc specially compounded for air, always forms a perfect contact on the seat.

A press of the button gives a full volume of air — valve closes automatically when button is released.

This gun is made of bronze to the Jenkins high standard.

Fitted with Jenkins Disc especially made for air

30 DAYS TRIAL

Fill in the coupon below and return to us. Without obligation to you try this new air gun.

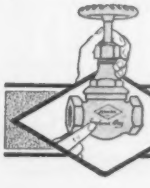
JENKINS BROS.,
80 White St., New York, N. Y.

JENKINS BROS., 80 White St., New York, N. Y.
Send us for 30 days' trial a ¼" Jenkins Air Gun.

Name .....

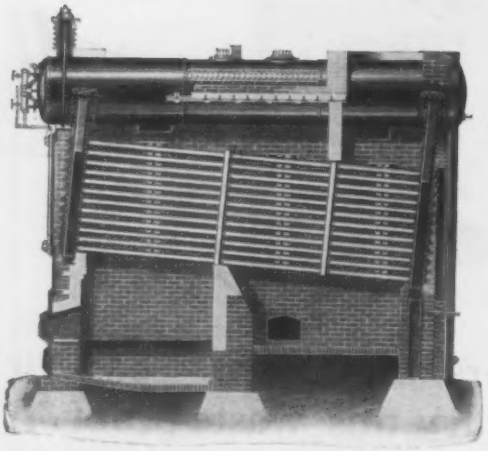
Address .....

City and State .....



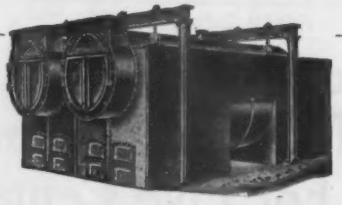
Always marked with the "Diamond"
Jenkins Valves
SINCE 1864

WATER TUBE BOILERS



HORIZONTAL WATER TUBE BOILERS
VERTICAL WATER TUBE BOILERS
TUBULAR AND MARINE BOILERS
STEEL CASINGS, SMOKE STACKS

THE CASEY-HEDGES CO.
CHATTANOOGA, TENN.
Quick Shipment Our Specialty. Send for Catalogs.



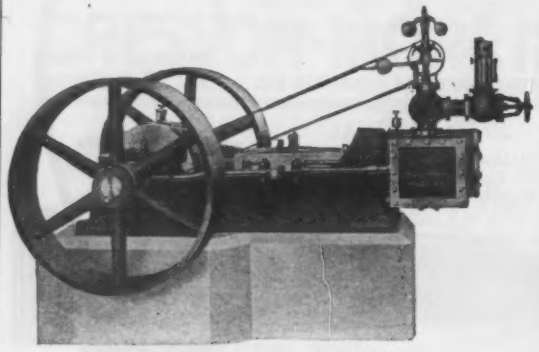
The Result of a Quarter Century Experience

These years of experience and study together with exhaustive tests and improvements, has enabled us to build modern boilers that are second to none—in design, construction, high efficiency and capacity, economical operation, and low cost for upkeep.

Made in several types. Write us today and let us send you full data and reasons why the W & W BOILER will best meet your requirements.

The Walsh & Weidner Boiler Co.
CHATTANOOGA, TENN.

WALSH & WEIDNER
TUBULAR WATER TUBE **BOILERS**



J. S. Schofield's Sons Co.
Macon, Georgia
MANUFACTURERS OF
High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.
Heavy Castings and Wrought Iron Works.

BUYING
as affected by
SELLING

IT IS to your interest to know that goods are **well sold**, as well as well made. You have to pay the cost of selling just as you have to pay for the cost of manufacturing. Think it over.

And the cost of selling is no small item. In some cases it costs more to sell goods than to make them. The seller who clings to antiquated expensive methods of selling is no more entitled to your patronage than the one who runs an out-of-date factory, because **you have to pay** the additional costs in either case.

If the waste is to be squeezed out of selling, the buyer cannot escape a share of the responsibility in bringing it about.

THIS means recognizing the efforts of those sellers who have adopted modern, economical methods of selling, and one of these beyond any question is good advertising in good Business Papers.

Advertising not only cuts the cost of selling, but it increases production volume and lowers manufacturing costs. It standardizes quality, and is a guarantee of good faith.

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.

Real Double Carded COTTON YARN

SPUN BY

THE MYRTLE MILLS, (INC.)

At our Myrtle plant we run choice, white, long staple cotton through two complete sets of cards. This produces a yarn so smooth and clean that it is often judged to be a combed yarn. It is spun in sizes ranging from 36s to 60s, single and ply, in right twist, suitable for knitting, weaving, mercerizing, and converting purposes; and in left twist, in sizes 30s to 45s, suitable for thread converting purposes.

Quotations and samples promptly submitted.

H. A. FLORSHEIM, *General Sales Mgr.*

225 Fifth Avenue **New York, N. Y.**

Also exclusively representing

GRAY MFG. CO.
FLINT MFG. CO.
ARLINGTON COTTON MILLS
PARKDALE MILLS, INC.
ARROW MILLS, INC.
ARKRAY MILLS, INC.

Weimar Bros.

Phone Connections

Works, 2046-48 Amber Street,

PHILADELPHIA, PA.

MANUFACTURERS OF

Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

CARVER-BEAVER YARN CO.

Successors to A. D. SALKELD & BRO., Inc.

ALL NUMBERS COTTON MERINO YARNS ALL COLORS WOOL WORSTED

366 BROADWAY, NEW YORK

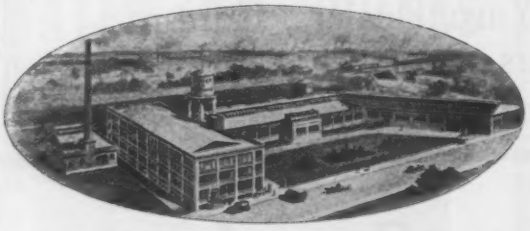
STENCILS FOR COTTON SHIPPERS, COTTON MILLS MERCHANTS & MANUFACTURERS - ALSO BRUSHES, INK, MARKING POTS

RUBBER STAMPS, NOTARIAL - CORPORATION SEALS

ATLANTA RUBBER STAMP & STENCIL WORKS

OFFICE 33 LUCKIE ST. WORKS 1350 EDGEWOOD AVE.

P.O. BOX 834 LARGEST STENCIL AND STAMP HOUSE IN GEORGIA ATLANTA, GA.



View of our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

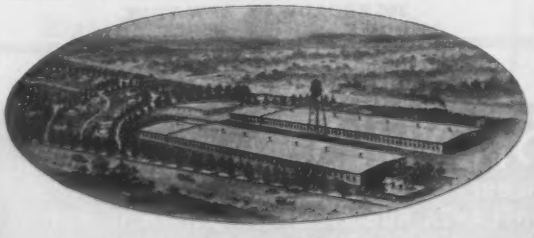
Established 1908

Spinners, Bleachers, Dyers and Mercerizers of High Grade Combed Yarns

By using our Spinning and Mercerizing you are always assured of a standard product.

"From the Cotton Field Direct to You"

Main Office, Factory and Warehouse
J and East Venango Sts., PHILADELPHIA



Spinning Mills, Lincolnton, N. C.

J. H. LANE & CO.

Tire Fabrics — Cord Fabric
Enamelling Duck — Wide Drill
Sheeting — Osnaburg

Special Constructions
Cotton Fabrics

250 W. 57th St.
NEW YORK

226 West Adams St.
CHICAGO

ESTABLISHED 1872

H. & B. BEER

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MEMBERS OF

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New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

Callaway Mills

INCORPORATED

345 Madison Avenue

Phone—Murray Hill 7801

NEW YORK

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Unity Cotton Mills
Milstead Manufacturing Co.
Elm City Cotton Mills
Manchester Cotton Mills
Hillside Cotton Mills
Unity Spinning Mills
Villa Rica Cotton Mills
Athens Manufacturing Co.

Boston Representative
M. R. ABBOTT
110 Summer Street

Chicago Representative
RAY T. JOHNSON
226 W. Adams Street

J. B. JAMIESON CO.

77 SUMMER ST.

BOSTON MASS.

Commission Merchants

COTTON YARNS

of all descriptions for weaving and knitting.

We solicit accounts.

Wire or write us any offerings.

WOODWARD, BALDWIN & CO.

43 and 45 Worth Street, New York

Selling Agents for

SOUTHERN COTTON MILLS

Manufacturing Well Known Brands of

SHEETINGS *SHIRTINGS*
DRILLS *DUCKS*
DIAPER CLOTH *TOWELS*

For Home and Export

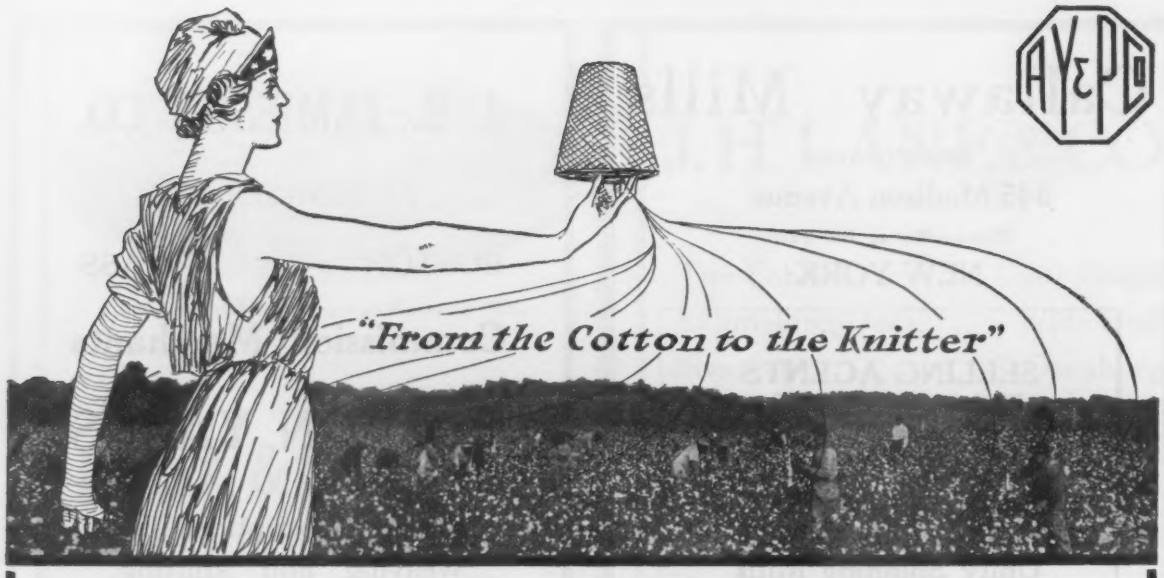
ALL WEIGHTS AND CONSTRUCTIONS OF PRINT CLOTHS AND FINE CLOTHS IN PLAIN AND FANCY WEAVES.

Outing Flannel and Romper Cloths
Towels and Diaper Cloths
Pajama Checks

Baltimore
St. Louis
St. Joseph
St. Paul

Philadelphia
San Francisco
Minneapolis
Cincinnati

Boston
Chicago
Shanghai, China



AMERICAN YARN & PROCESSING CO.

MOUNT HOLLY, N. C.

SPINNERS AND MERCERIZERS

HIGH GRADE COMBED AND CARDED YARNS—16s to 80s

Our Mercerized Yarns Are the Product of Our Own Mills

General Office, Mt. Holly, N. C. Branch Office, 1111 James Bldg., Chattanooga, Tenn.

Representatives

H. B. ROBIE, 346 Broadway, New York City FORREST BROS., Forrest Bldg., Philadelphia

F. W. LAFRENTZ & COMPANY

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The American Audit Company

Located at

New York	Baltimore	New Orleans	Philadelphia
Richmond	Milwaukee	Scranton	Wilkes-Barre
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Chicago			London, E. C.

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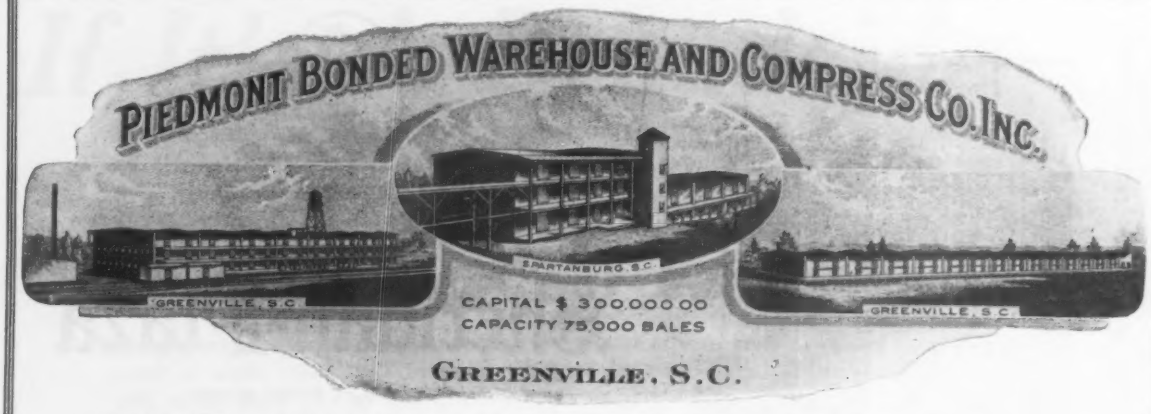
C. B. Bidwell, C. P. A. (Ga.)

1013 Fourth National Bank Building,

ATLANTA, GA.



OVER 500,000 bales of cotton are consumed annually within a radius of 50 miles of this Warehouse.
Situated in the midst of the great Cotton Manufacturing district of the Carolinas.
Facilities for distributing Mill Cotton are unsurpassed.
Have re-shipping privileges, without additional cost, from all points throughout the Cotton States South and West of Atlanta, Georgia.
Its receipts are well and favorably known to all Southern, Eastern and Western Banks.
Warehouses are protected with Sprinkler System, which guarantees best insurance rates.
Our rates for services rendered patrons are reasonable.
For further information, apply to

C. T. TURNER, Manager, Greenville, S. C.

Cooper & Griffin

INCORPORATED

HEAD OFFICE

Greenville, S. C.

COTTON

—BRANCHES—

Spartanburg, S. C.	Sumter, S. C.	Toccoa, Ga.
Anderson, S. C.	Atlanta, Ga.	Charlotte, N. C.
Seneca, S. C.	Savannah, Ga.	Norfolk, Va.

UPTOWN CHICAGO'S
MOST FAVORED HOTEL
500 ROOMS, EACH WITH PRIVATE BATH

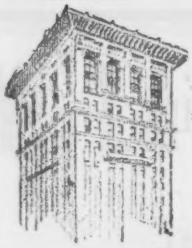
Hotel Sheridan-Plaza

CHICAGO
Sheridan Road at Wilson Avenue

Thousands who know the Chicago of today now prefer the large hotels of the North Shore. The beautiful new Sheridan Plaza is not only "Uptown Chicago's most favored hotel," but one of America's finest. Whether you come on business or for recreation, the Sheridan Plaza will please you. Music and dancing every evening. Moderate costs. Excellent Restaurant; Narcissus Grill cafeteria. Eighteen minutes from down-town; elevated express and surface lines; motor busses to and from downtown, through Lincoln Park, stop at the door. Exceptional garage accommodations.

European plan. Rooms, with private bath, $3.00 a day and up. Reservations are advisable.

The Old FIRST



Est. 1865

FIRST NATIONAL BANK
OF RICHMOND. VA.

With
EXPERIENCE—Over 57 Years
STRENGTH—Capital & Surplus $4,000,000.00
OFFICERS—Experienced, capable and well versed on conditions and credits thruout this territory.

INVITES YOUR BUSINESS

JOHN M. MILLER, Jr., Pres.
Resources over $30,000,000

F. W. LAFRENTZ & COMPANY
announce that they
will handle all Auditing, Accounting, Systematizing and Tax Work heretofore done by them under the name of The American Audit Company.

F. W. Lafrentz, C. P. A. (N. Y.)
A. F. Lafrentz, C. P. A. (N. Y.)
C. B. Bidwell, C. P. A. (Ga.)
AT
1013 Fourth National Bank Bldg.
Atlanta, Ga.
'Phone Walnut 0869

HUGHES FAWCETT
IMPORTER AND COMMISSION MERCHANT

LINEN YARNS
For Weaving, Knitting and all Purposes.

TURKEY RED YARNS
For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine
And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK

If It's A Broadside—

If it is an especially large illustration for an especially large piece of literature, chart, birds eye view, map, etc. Whether it be in one or more colors, our plant is equipped to supply your needs. No halftone or line plate too large or too small for our equipment.

Illustrating Your Literature

Sometimes in the preparation of your sales and advertising plans you find the need of some especially prepared piece of literature, the execution of which will baffle your photographer, electrotyper and printer. Frequently you may seek a service that the ordinary plant cannot give.

Our plant is designed and equipped for the accomplishment of many difficult products that cannot be secured from most photo-engraving establishments; is equipped to furnish the best of photo-engraving, electrotyping, printing, nickeltyping, commercial art and allied service, whether large or small, whether one or more colors. The extent of our equipment is reflected in the large process camera, which can furnish you with process color plates as large as a yard square. One of the 6 largest in the world. If you have an idea you wish carried into execution, we are at your service. We will gladly perfect it and illustrate it.

Battery of Cameras in the Photo-Engraving Department

A Close Up View of One of the 6 Largest Color Process Photo-engraving Cameras in the World—Installed in the Photo-engraving Dept. of Jacobs & Co.

General Offices Advertising and Multigraphing
Electrotyping Nickeltyping
Photo Engraving Commercial Art Photography
Fine Arts Printing and Binding

Jacobs & Company

Clinton, S. C.

Advertising, Commercial Art
Photo-Engraving—Electrotyping
Nickeltyping
Color Printing

CLASSIFIED ADVERTISING

RATES:

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(*When replies are to be received in our care, allow four words for box address,*)

$100,000.00 will buy NEW TOWEL MILL

Located in Western New York. Completely equipped with bleachery and finishing plant. Must be sold to settle an estate.

Address

"W. J. R."

care COTTON,

ATLANTA GEORGIA

EXECUTIVE

Seeks Desirable Connection

MAN with number years experience in manufacture of Cotton Goods, also engineering and costing experience, anxious to make desirable connection with good organization. Past connections have been with large organizations and positions held have been in the executive capacity. At present employed as Sup't. of Yarn Mill. Good technical training. Age 33. Best of reference. Address Box 63, care of COTTON, Grant Bldg., Atlanta, Ga.

WANTED—Position as Superintendent or Agent of a small cotton mill. Technically trained man, 38, wishes to advance. Is experienced both as Master Mechanic and in the textile end. Address Box 78, care COTTON, Atlanta, Ga.

WANTED—Position as Electrician. Experienced in management of dynamos, motors, armature windings, wiring distribution systems. Address Box A, care COTTON, Atlanta, Ga.

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

FOR SALE

A Gessner Twentieth Century Double Bed 90" Rotary Cloth Finishing Press in excellent condition.

SCHADEWALD,
3rd & Huntington Sts.,
Philadelphia, Pa.

POSITION WANTED

Young man 23 years of age desires a position as a dyer or an assistant dyer in a Hosiery Mill. Experienced on all classes of hosiery. Best of reference. Answer Box 64, care COTTON, Atlanta, Ga.

Do You Want to Sell It?

Probably you, like many other mills, have some equipment which you have taken out, or are thinking of taking out and replacing with new equipment.

Why not dispose of this second-hand equipment at a profit? COTTON is read by thousands of Cotton Mills that are hardly touched by Northern journals.

You Can Sell Your Second-Hand Equipment

to these mills through advertising in the Classified Advertising Section of COTTON. Such advertising produces results at small cost—why not try it out and get that second-hand equipment off your hands in a profitable way? Tell us what you have for sale and let us insert an advertisement for you.

COTTON

GRANT BUILDING ATLANTA, GA.

Textile Mill Equipment

All At Bargain Prices

Cotton Dryers

25—Sargent No. 24 six section 8 foot Cotton Dryers. Overall dimensions 99′4″ long, 15′5″ wide, 7′10′ high. Equipped with Model "M" Self feeder. Hot air drawn through belt by 33″ exhaust fans. Constructed throughout of metal angles and plates.

Mixing Pickers

25—Sargent Cylindrical type 48″ Mixing Pickers. Equipped with single pair fluted feed rolls, 3½″ diameter. Cylinder provided with 6 heavy steel bars on lugs bolted to spider. Capacity 600 to 800 lbs. per hour.

Cotton Washers

25—Sargent 48″ Special Cotton Washers or Rinsers. Complete with cast iron frame, pans, squeeze rolls, kicker and conveyor.

Feeders

25—Sargent 48″ Model "M" Feeders for Sargent Dryers.

Concentrators

8—Noble and Wood Concentrators right and left hand cylinder washers with octagon cylinder diameter 44″, length 42″. Rotates at 6 R.P.M. Vat is 1′4½″ wide, 6′9″ long, 2′9″ high.

Wringers

65—42″ American Tool and Machine Co. Centrifugal Wringers. Complete with 42″ perforated steel basket shell, with steel top, basket 22½″ inside depth, ⅜″ steel Wringer direct connected to 40 H.P. Motor.

18—Sets 36″ American Tool and Machine Co. Belt Driven Centrifugal Wringers. Each set arranged in batteries of three.

Digesters

40—Welded Steel Digesters. Capacity 1300 cu. ft. Inside diameter 8′, length overall 27′. Complete with cast iron supporting ring, false bottom, hoppers, guides and all accessories.

823 H.P. Boilers

36—823-H.P. Stirling Boilers. Class M-30, complete with all accessories. Babcock & Wilcox Co., New York, makers. 200 lbs. pressure, 630 3½-in. tubes, No. 10 gauge, 150 of these tubes are circulators. Steam drums, double riveted, double strap butt join', 1-in. rivets. Thickness shell plate and tube ends in steam drums ⅞ in. mud drum 1 in. Space occupied by boiler 18 ft. by 22 ft. 3 in. by 29 ft. 9 in. high. Complete with all accessories.

350 H.P. Engines

18—Corliss Engines. Maker Allis-Chalmers Co. 350 H.P. 18 in. x 36 in. double eccentric, semi-high speed, 125 R.P.M., simple Corliss belted type, designed to operate on 140 lbs. steam pressure with 1½ lbs. back pressure. Double eccentric allows cut off up to 75 per cent of stroke. Flywheel 11 ft. diameter by 32-in. face. Complete with Phoenix individual oiling system. Type R, size 30, made by Richardson-Phoenix Co.

Motors

225—Slightly used Motors 7½-75 H.P. 3 Phase 60 Cycle, 440 Volt.

Tanks

1000—Steel Tanks, 100-55,000 gallon capacity.

350—Wood Tanks, New and Used

Size	Capacity
12′6″ x 11′	10150 gal.
12′6″ x 18′	16600 gal.

Send for Bulletin No. 7.

Scales

500—Howe and Fairbanks Scales. Capacities 600 lbs. to 100 tons. Guaranteed to be in good condition.

Transmission

Pulleys	Shafting
Pillow Blocks	Drop Hangers
Bearings	Couplings
Floor Brackets	Floor Stands
Friction Clutches	Collars

Write for Bulletin No. 15.

Let us submit our quotations and save you money

NASHVILLE INDUSTRIAL CORPORATION

JACKSONVILLE, TENNESSEE

Buyers' Index

ACETYLENE GAS.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

ACETYLENE WELDING APPARATUS.
(See Welding Apparatus.)

ACIDS.
(See Dyestuffs and Chemicals.)

ACCOUNTANTS.
Ernst & Ernst.
La Frentz & Co., F. W.

ACCOUNTING SYSTEMS.
Ernst & Ernst.

ADDING MACHINES.
Monroe Calc. Mch. Co.

AERATING AND CLEANING MACHINE.
Murray Co., The.

AIR WASHERS.
American Blower Co.
Buckeye Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.
Sturtevant Co., B. F.

AIR COMPRESSORS.
(See Compressors.)

AIR CONDITIONING SYSTEMS
(See Humidifying Apparatus.)

ALBONE.
Roessler & Hasslacher Chemical Co.

ALKALIES.
(See Dyestuffs and Chemicals.)

ALUM.
(See Finishing and Sizing Materials.)

ANILINE COLORS.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE ACID GENERATOR.
Macomb Machine Co.

APRONS—RUB.
Bond Co., Chas.

ARCHITECTS AND ENGINEERS.
Lockwood, Greene & Co.
Robert & Co.
Sirrine, J. E.
Stuhrman, Edw. A.

ARTWORK.
Jacobs & Co.

ASH HANDLING MACHINERY.
(See Coal Handling Machinery.)

ASPHALT SLATE SHINGLES.
(See Slate Asphalt Roofing.)

ASPIRATORS.
Belger Co.

AUDITORS AND ACCOUNTANTS.
Ernst & Ernst.
La Frentz & Co., F. W.

AUTO TRUCKS.
(See Trucks—Auto.)

AUTOMATIC CONTROLLERS (TEMPERATURE).
(See Temperature Regulators.)

AUTOMATIC LOOM ATTACHMENTS.
(See Loom Attachments.)

AUTOMATIC FEEDS FOR COTTON.
Philadelphia Drying Mchy. Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Whitin Mch. Works.

AUTOMATIC SCALES.
(See Scales.)

AUTOMOBILES.
White Co.

BACKWASHERS.
Sargent's Sons Corp., C. G.

BAROMETERS.
Taylor Instrument Co.

BALL BEARINGS.
Aldrich Mch. Works.
Dodge Mfg. Co.
Fulton Supply Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BALL BEARING HOUSINGS.
Aldrich Machine Works.
Fafnir Bearing Co.
Fulton Supply Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BALE BAND BUCKLES.
(See Box Strapping & Buckles.)

BALE OPENERS.
(See Openers.)

BALING MACHINES.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Logemann Bros.
Rex Eng'g Corp.
Saco-Lowell Shops.

BALING PRESSES.
(See Presses.)

BANDAGES, TAPES, ETC.
American Textile Banding Co.
Weimar Bros.

BANDAGE & TAPE MACHINES.
Foster Machine Co.
Whitin Mch. Wks.

BANDS.
(See Tapes.)

BANDS (HOSIERY LABELS AND STICKERS).
Kirby-Cogeshall Co.

BANKS.
First Nat'l Bank of Richmond.

BARRELS—FIBRE.
(See Fibre Products.)

BASKETS—MILL.
(See Boxes—Mill.)

BATH CABINET—SHOWER.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

BATTERIES (ELEC.)
(See Storage Batteries.)

BEAMS.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAM DYEING MACHINES.
Brandwood, John.
Cocker Mch. & Fdry. Co.

BEAM HEADS.
Jordan Mfg. Co.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAMING AND WARPING MACHINERY.
(See Warpers and Warping Machinery.)

BEARINGS.
Cresson-Morris Co.
Dodge Mfg. Co.
Fulton Supply Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Renold, Inc., Hans.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BELTING (LEATHER, CANVAS AND RUBBER).
American Supply Co.
Bond Co., Chas.
Fulton Supply Co.
Gastonia Belting Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELTING—CHAIN.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.

BELTING (ROUND—LEATHER).
Bond Co., Chas.
Gastonia Belting Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.

BELTING—ROPE.
(See Rope Transmission.)

BELT CONVEYORS.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Morse Chain Co.

BELT DRESSING.
Bond Co., Chas.
Dixon Crucible Co., Jos.
Fulton Bag & Cotton Mills.
Gastonia Belting Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT FASTENERS.
Bristol Co.
Carr Fastener Co.
Clipper Belt Lacer Co.
Detroit Belt Lacer Co.
Fulton Supply Co.

BELT LACING (LEATHER).
Bond Co., Chas.
Dodge Mfg. Co.
Fulton Supply Co.
Gastonia Belting Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. B.
Williams & Sons, I. B.

BELT TIGHTENERS.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Rhoads & Sons, J. E.
Wood's Sons Co., T. B.

BENCH DRAWERS.
Lupton's Sons Co., David.

BENCH LEGS (PRESSED STEEL).
Lupton's Sons Co., David.

BENCHES (PARK AND PLAYGROUND).
(See Playground Equipment.)

BLEACHERIES.
(See Dyers, Bleachers and Finishers.)

BLEACHING KIERS.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.
Woolford Wood Tank Co., G.

BLEACHING MACHINERY.
(See Dyeing, Bleaching and Finishing Machinery.)

BLEACHING, FINISHING AND SIZING MATERIALS.
(See Finishing Materials.)

BLOWERS AND BLOWER SYSTEMS.
American Blower Co.
Buckeye Blower Co.
Carrier Eng. Corp.
General Electric Co.
Philadelphia Drying Mchry. Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

BOARDS—FIBRE.
National Vulcanized Fibre Co.
Standard Fibre Co.

BOARDS—FORM.
Pearson, Jos. T.

BOBBINS.
Draper Corporation.
Fulton Supply Co.
Jordan Mfg. Co.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
Shambow Shuttle Co.
Vermont Spool & Bobbin Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

BOBBIN HEADS.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

BOBBIN STRIPPERS.
Crompton & Knowles Loom Works.
Terrell Machine Co.

BOILERS.
Casey-Hedges Co.
Cole Mfg. Co., R. D.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

BOILER COMPOUNDS.
Dixon Crucible Co., Jos.

BOILER FEED WATER PURIFICATION.
American Water Softener Co.
Casey-Hedges Co.
Norwood Engineering Co.
Scaife & Sons, Wm. B.

BOILER ROOM FITTINGS AND SUPPLIES.
American Blower Co.
Bristol Co.
Casey-Hedges Co.
Crane Co.
Dixon Crucible Co., Jos.
Fulton Supply Co.
Godfrey Conveyor Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.
Sturtevant Co., B. F.

BOILER GRATES AND STOKERS.
(See Grates and Stokers.)

BOOKKEEPING MACHINES.
Monroe Calc. Mch. Co.

BOX STRAPPING AND TIE BUCKLES.
(See Banding Straps and Buckles.)

BOXES—MILL.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
National Vulcanized Fibre Co.
Standard Fibre Co.

BOXES—PACKING.
(See Packing Boxes.)

BRAID.
(See Tapes.)

BRAZING.
(See Welding.)

BROKERS—COTTON.
(See Cotton Dealers & Brokers.)

BROKERS—STOCK.
(See Stocks and Bonds.)

BROOMS.
(See Brushes.)

BROOMS—REFILLABLE.
Re-Fil-It Broom Mfg. Co.
Wonderlich Co., H.

BRUSHES—MILL.
Atlanta Brush Co.
Re-Fil-It Broom Mfg. Co.
Southwestern Broom Mfg. Co.
Wonderlich Co., H.

BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

BUCKETS AND PAILS—MILL.
Standard Fibre Co.

BUCKETS—ELEVATOR AND GRAB.
Link-Belt Company.

BUCKLES—COTTON TIE.
(See Box Strapping and Ties.)

BUILDING CONTRACTORS.
(See Contractors.)

BUILDINGS (PORTABLE STEEL).
Dowman-Dozier Mfg. Co.

BUILDINGS (READY BUILT).
Minter Homes Co.

BUILDINGS (ALL STEEL).
Truscon Steel Co.
Maryland Metal Building Co.

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Anchor Post Iron Works.
Barrett Co., The.
Birmingham Slag Co.
Bogart & Carlough Co.
Coolidge & Sons, F. J.
Dixie Portland Cement Co.
Detroit Graphite Co.
DeVilbiss Mfg. Co.
Dowman-Dozier Mfg. Co.
Dowman, George.
Dufur & Co.
Hough Shade Corp.
Knapp Fence Co.
Lupton's Sons Co., David.
Maryland Metal Building Co.
Minter Homes Co.
Richardson Co.
Sanymetal Products Co.
Sonneborn Sons, Inc., L.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.
St. Louis Surfacer & Paint Co.
Truscon Steel Co.
Variety Fire Door Co.
Wagner Mfg. Co.
Walker Electric & Plb. Co.
Ware Paint Co.

BURR PICKERS.
Proctor & Schwartz, Inc.
Sargent's Sons, C. G.

BUSHINGS.
Southern Spindle & Flyer Co.

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(See Consultants.)

CABINETS.
(See Lockers.)

CALCULATING MACHINES.
Monroe Calculating Mch. Co.

CALENDERS.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.

CALENDER ROLLS.
(See Rolls—Calender.)

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Carter Electric Co.

CAMLESS DETACHING DEVICES.
Belger Co.

CANNING OUTFIT.
Home Canner Co.

CANS—ROVING.
National Vulcanized Fibre Co.
Standard Fibre Co.

CANS (DRYING).
(See Drying Equipment.)

CARS AND TRUCKS—FIBRE.
(See Trucks.)

CARDS (HAND STRIPPING).
Howard Bros. Mfg. Co.

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Klauder-Weldon Dyeing Machine Co.
Macomb Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry Co.
Tolhurst Mch. Works.

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Howard & Bullough.
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Saco-Lowell Shops.
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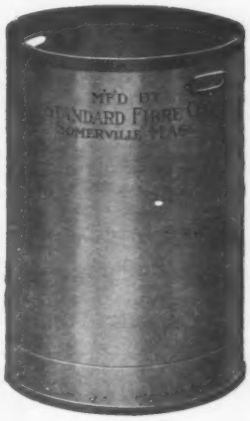

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Whitin Machine Works.

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Crompton & Knowles Loom Works.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Schofield, Wm., Co.
Textile Finishing Mchry Co.

CARRIER APRONS.
(See Aprons.)

CARRIER SYSTEM.
Curtis Pneumatic Machry. Co.

CASES—WOODEN.
(See Packing Cases.)

CASTINGS.
Briggs, Schaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

CAUSTIC SODA.
(See Bleaching Materials.)

CEMENT.
Dixie Portland Cement Co.

CEMENT REINFORCEMENT.
Birmingham Slag Co.
Truscon Steel Co.

CEMENT AND BRICK COATING.
American Cement Paint Co.
Detroit Graphite Co.
Coolidge & Sons, F. J.
Dixon Crucible Co., Jos.
St. Louis Surfacer & Paint Co.
Hockaday Co.
Sonneborn Sons, Inc., L.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

CENTRAL STATION (ELECTRIC).
Alabama Power Co.
Georgia Railway & Power Co.
Tennessee Electric Power Co.

CENTRIFUGALS.
Cresson-Morris Co.
Fletcher Works.
Goulds Mfg. Co.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

CHAIN DRIVES.
(See Belting—Chain Link.)

CHAIN—BLOCK, BICYCLE, AUTO, ENGINE, AGRICULTURAL, ETC.
Fulton Supply Co.
Link Belt Co.
Morse Chain Co.
Renold, Inc., Hans.

CHAIRS AND STOOLS.
(See Furniture—Mill.)

CHECK STRAPS.
Bond Co., Chas.
Fulton Supply Co.
Hayes Loom Reed & Harness Co.
Jacobs Mfg. Co., E. H.

CHEMICALS.
(See Dyestuffs and Chemicals.)

CHLORINE GAS.
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

CLEANING AND AERATING MACHINE FOR COTTON.
Murray Company, The.

CLEARER CLOTH.
Philadelphia Felt Co.

CLOCKS—HANK, ETC.
(See Counters.)

CLOCKS (TIME).
Root Co.
Silberberg, Mortimer J.

CLOCKS—WATCHMAN.
Foxboro Co., Inc.
Root Co.

CLOSETS—WATER.
(See Toilets.)

CLOTH—ROLLER, CLEARER, SLASHER.
Philadelphia Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Foster Machine Co.
Wildman Mfg. Co.

CLOTH REELS.
Gallaudet Aircraft Corp.

CLOTH ROOM MACHINERY.
Butterworth, H. W., & Sons Co.
Firsching, J. A.
Foster Machine Co.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Textile Finishing Mchry. Co.
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch. Wks.

CLOTH TESTERS.
Scott Co., Henry L.

CLOTH WINDERS.
(See Winders.)

CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Fulton Supply Co.
Link-Belt Company.
Mason, Volney W.

CLUTCH LININGS.
Carlyle-Johnson Mch. Co.

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Godfrey Conveyor Co.
Link-Belt Company.

COAL TAR DISINFECTANTS.
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
(See Aprons.)

COMBERS AND COMBER SUPPLIES.
Belger Co.
Foster Machine Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Wks.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

COMPRESS (COTTON).
Piedmont Bonded Warehouse & Comp. Co.

COMPRESSORS—AIR, GAS, ETC.
Allis-Chalmers Mfg. Co.
Curtis Pneumatic Mchry Co.
Fulton Supply Co.
General Electric Co.
Goulds Mfg. Co.

COMMUTATOR BRUSHES.
(See Brushes—Motor and Generator.)

CONCRETE REINFORCEMENT.
Birmingham Slag Co.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDUITS.
(See Elec. Machinery & Supplies.

CONE (KNITTING YARN).
Foster Mch. Co.

CONE WINDING MACHINE.
(See Winding Machinery.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

CONSULTANTS (BUSINESS METHODS).
Ernst & Ernst.

CONSULTING ENGINEERS.
(See Architects and Engineers)

CONTRACTORS AND ENGINEERS—BUILDING.
Dowman, George.
Dowman-Dozier Mfg. Co.
Sirrine & Co., J. E.
Stuhrman, Edw. A.
Truscon Steel Co.

CONTRACTORS—ELECTRICAL.
(See Electrical Engineers.)

CONTRACTORS (HEATING & PLUMBING).
Walker Electric & Plb. Co.

CONTROLLING INSTRUMENTS—TEMPERATURE.
Bristol Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

CONVEYORS—BELT.
(See Belt Conveyors.)

CONVEYING MACHINERY.
American Supply Co.
Chisholm-Moore Mfg. Co.
Collins, J. D.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Euclid Crane & Hoist Co.
Fulton Supply Co.
Godfrey Conveyor Co.
Link-Belt Co.
Mason, Volney W.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Renold, Hans.
Schofield, Wm. Co.
Wagner Mfg. Co.

CONVEYORS—PORTABLE.
Euclid Crane & Hoist Co.
Link-Belt Co.

COOLERS.
(See Humidifying Apparatus.)

COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING EQUIPMENT.
American Blower Co.
Buckeye Blower Co.
Sturtevant Co., B. F.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

CORDAGE MACHINERY.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

COST SYSTEMS.
Ernst & Ernst.

COTTAGES (READY BUILT).
Minter Homes Co.

COTTON CLEANING AND AERATING MACHINE.
Murray Company, The.

COTTON FANS.
(See Blowers.)

COTTON YARN AND CLOTH COMMISSION MERCHANTS AND DEALERS.
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Fiorsheim, H. A.
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Durant Mfg. Co.
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Fletcher Works.
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Foxboro Co., Inc.
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Greist Mfg. Co.
Hayes Loom Reed & Harness Co.
Hopedale Mfg. Co.
Howard & Bullough.
Hunt Machine Co., Rodney.
Hyatt Roller Bearing Co.
Jacobs Mfg. Co., E. H.
Lestershire Spool Mfg. Co.
Lowell Crayon Co.
Mill Devices Co.
Mossberg Pressed Steel Corp.
National Vulcanized Fibre Co.
Parker Co., Walter L.
Phila. Drying Mchry. Co.
Philadelphia Felt Co.
Proctor & Schwartz, Inc.
Root Co.
Roy & Son, B. S.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Stafford Co.
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Sturtevant Co., B. F.
Suter, Alfred.
Terrell Machine Co.
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Textile Rubber Co.
Toledo Scale Co.
Tolhurst Mch. Wks.
Universal Winding Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.
Washburn & Sons, L. R.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

COTTON STORAGE WAREHOUSE.
Piedmont Bonded Warehouse & Comp. Co.

COTTON TAPE LOOM.
Fletcher Works.
Foster Mch. Co.
Schaum & Uhlinger.

COTTON YARN MILLS.
(See Yarn Manufacturers.)

COUNTERS—REVOLUTION, HANK, PICK, ETC.
Bristol Co.
Durant Mfg. Co.
Foxboro Co.
Root Co.

COUNTERS—RESTAURANT.
(See Restaurant Equipment.)

COUPLING—SHAFT.
Cresson-Morris Co.
Dodge Mfg. Co.
Wood's Sons Co., T. B.

COVERING—ROLLER.
Bond Co., Chas.
Philadelphia Felt Co.

CRANES.
(See Hoists.)

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Lowell Crayon Co.

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Auto Creel Corp.
Suter, Alfred.
Warp Compressing Mch. Co.

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Southern Wood Preserving Co.

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(See Cloth Cutters.)

CUTTERS—THREAD.
(See Thread Cutters.)

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(See Boxes—Packing.)

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Lupton's Sons Co., David.

DEXTRINES.
(See Dyestuffs and Chemicals.)

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(See Scales.)

DIES—STEEL.
(See Stamps, Stencils, Etc.)

DIE STOCKS.
(See Pipe Threaders.)

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Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOBBY CARDS.
Jacobs & Co., E. H.

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(See Boxes—Mill.)

DOFFER FILLETS.
(See Fillets.)

DOFFING CARS.
(See Cars.)

DOORS—STEEL.
Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.
Variety Fire Door Co.

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Jacobs & Co.

DRAWING FRAMES.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

DRILLS—ELECTRIC.
(See Electric Machinery.)

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

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Draper Corp.
Greist Mfg. Co.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

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Buckeye Blower Co.
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Proctor & Schwartz, Inc.
Sturtevant Co., B. F.

DRYING FORMS—HOSIERY.
Pearson, Jos. T.

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Cocker Mch. & Fdry. Co.
Dryer Corp. of America.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
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Sturtevant Co., B. F.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
(See Blowers and Blowing Systems.)

DUSTING MACHINERY.
Proctor & Schwartz, Inc.
Schofield Co., Wm.

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American Yarn & Processing Co.
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Sayles Finishing Plants.
United Piece Dye Wks.

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Brandwood, John.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Cole Mfg. Co., R. D.
Dryer Corp. of America.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Hunt Machine Co., Rodney.
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Macomb Machine Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Woolford Wood Tank Co., G.

DYEING MACHINES (PACKAGE AND SPOOL).
Brandwood, John.
Franklin Process Co.

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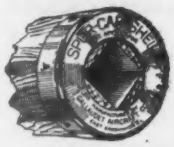
Phila. Drying Machinery Co.

DYE VATS AND TUBS.
(See Tanks or Bleaching Kiers.)



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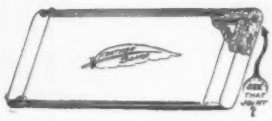

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Ford Co., J. B.
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Kali Mfg. Co.
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Roessler & Hasslacher Chemical Co.
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Rohm & Hass Co.
Sandos Chemical Co.
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Walker Elec. & Plbg. Co.

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Mason, Volney W.
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Southern Elec. Supply Co.
Sturtevant Co. B. F.
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Walsh & Weidner Boiler Co.
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Rex Eng'g Corp.

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Mitchell-Bissell Co.

ENAMEL—MILL WHITE.
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Fulton Supply Co.

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Cole Mfg. Co., R. D.
Fulton Supply Co.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
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Toomey, Frank.

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Lunkenheimer Co.
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Jacobs & Co.

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Jacobs & Co.

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EXPORTERS—COTTON.
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Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

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Lupton's Sons Co., David.

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Buckeye Blower Co.
Carter Electric Co.
General Electric Co.
Southern Electric Supply Co.
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(See Boiler Feed Water Purification.)

FEEDERS.
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Philadelphia Felt Co.

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Knapp Fence Co.

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Southern Wood Preserving Co.

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Standard Fibre Co.

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Howard Bros. Mfg. Co.

FILLING—CAP AND WARP.
U. S. Bobbin & Shuttle Co.

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American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

FILTERS—OIL REMOVAL.
Norwood Engineering Co.

FILTERS (ALUM).
Lennig & Co., Chas.

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Bosson & Lane.
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Electro Bleaching Gas Co.
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India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Lennig & Co., Chas.
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Metz & Co., H. A.
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Roessler & Hasslacher Co.
New Brunswick Chemical Co.
Pennick & Ford, Ltd.
Rohm & Haas Co.
Sandos Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.
Zurn Co., O. F.

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Dowman-Dozier Mfg. Co.
Dowman, George.
Lupton Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.
Variety Fire Door Co.

FIRE HOSE.
(See Hose—Fire.)

FIRE PROTECTING PAINT.
(See Paint.)

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U. S. Bobbin & Shuttle Co.

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Allis-Chalmers Mfg. Co.
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Cutler Works, George.
Ivanhoe Regent Works.
General Electric Co.
Southern Electric Supply Co.

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Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

FLOORING—WOOD BLOCKS.
Southern Wood Preserving Co.

FLOOR SCRUBBING MACHINE
American Scrubbing Equipment Co.

FLOOR SCRUBBING POWDERS.
(See Scrubbing Powders.)

FLOOR SWEEPS.
(See Brushes.)

FLUTED ROLLS.
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Southern Spindle & Flyer Co.
Whitin Machine Works.

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Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
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Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdy. & Mch. Wks.

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Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

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FUEL ECONOMIZERS.
Sturtevant Co., B. F.

FURNITURE—MILL.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

FUSES—ELECTRIC.
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Fulton Supply Co.
Seawell, Luke.
Southern Electric Supply Co.

GARAGES (PORTABLE—METAL).
Dowman-Dozier Mfg. Co.

GARNETT MACHINES.
Proctor & Schwartz, Inc.

GAS ENGINES.
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GAUGES—STEAM PRESSURE, ETC.
Bristol Co.
Fulton Supply Co.
Foxboro Co., Inc.
Taylor Instrument Co.

GAUGE—OIL.
Fulton Supply Co.
Lunkenheimer Co.

GAUGES (LIQUID LEVEL).
Foxboro Co., Inc., The.
Taylor Inst. Co.

GAUGES—WATER.
Fulton Supply Co.
Lunkenheimer Co.

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Dodge Mfg. Co.
Fulton Supply Co.
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Morse Chain Co.
Renold, Hans.

GEAR CUTTING AND CUTTERS.
Cresson-Morris Co.

GEAR PULLERS.
General Electric Co.

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Ernst & Ernst.

GRAPHITE.
Detroit Graphite Co.
Dixon Crucible Co., Jos.

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Cole Mfg. Co., R. D.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

GRATES—MECHANICAL.
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GRINDER—CARD, CYLINDER, ROLL, NAPPER AND GARNET.
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GUARDS—ELECTRIC LAMP.
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GUARDS—MACHINE, SKYLIGHT, WINDOW, ETC.
American Fence Const. Co.
Anchor Post Iron Works.
Dowman, George.
Knapp Fence Co.

GUIDES—THREAD.
Mitchell-Bissell Co.
Palmer Co., I. E.

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HALFTONES—PRINTING.
Jacobs & Co.

HANGERS.
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HANK CLOCKS.
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HARDWARE—BUILDING.
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Dowman-Dozier Mfg. Co.
Sanymetal Products Co.

HARNESS—LOOM.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Works.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Hayes Loom Reed & Harness Co.

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Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
U. S. Bobbin & Shuttle Co.

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Crompton & Knowles Loom Works.
Draper Corporation.
Steel Heddle Mfg. Co.
Williams Co., J. H.

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Steel Heddle Mfg. Co.
Williams Co., J. H.

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Curtis Pneumatic Mchry. Co.
Euclid Crane & Hoist Co.
Fulton Supply Co.
Link-Belt Company.
Mason, Volney W.
Morse Chain Co.

HOPPER FEEDERS.
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Cable Piano Co.
Conn, Ltd., C. G.

HOSE—FIRE.
Collins, J. D.

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Cole Mfg. Co., R. D.
Franklin Process Co.
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American Moistening Co.
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Sturtevant Co., B. F.

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Foxboro Co., Inc., The.

HYDRODEIKS.
Taylor Instrument Co.

HYGROMETERS.
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Curtis Co., The.
Huntington & Guerry.
Panton, Harrison D.
Ivanhoe-Regent Works.
Walker Elec. & Plbg. Co.
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Nashville Industrial Corp.
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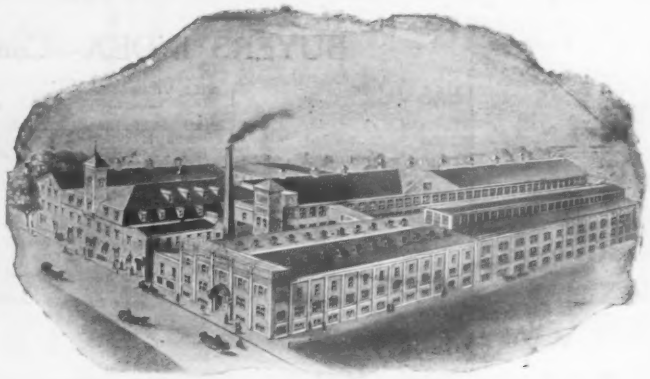

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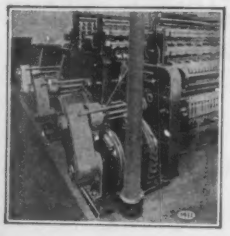

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Scott & Williams.
Torrington Co.
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Torrington Co.

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Barber-Colman Co.
Mill Devices Co.

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Kirby-Cogeshall Co.

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Bristol Co.
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Link-Belt Company.

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Royal Metal Mfg. Co.
Sanymetal Products Co.

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Fletcher Works.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

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Hopedale Mfg. Co.

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LUBRICANTS.
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Texas Co.

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Carr Fastener Co.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

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Briggs-Schaffner Co.
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Cresson-Morris Co.
Lombard Fdry. & Mch. Wks.

MARKING POTS, STENCILS, INKS, ETC.
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Bradley Mfg. Co., A. J.

MERCERIZED YARNS.
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MERCERIZERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Sayles Finishing Plants, Inc.

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American Yarn & Pro. Co.
Boger & Crawford Co.
Dixie Mercerizing Co.
Hunter Mfg. & Comm. Co.
United Piece Dye Wks.

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Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

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Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.
Truscon Steel Co.

METAL SIDING.
Dowman-Dozier Mfg. Co.

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Dowman-Dozier Mfg. Co.

METERS—FLOW, AIR, GAS, ELECTRIC, STEAM, ETC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

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MILL BASKETS AND BOXES.
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MILL VILLAGES.
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MOPS.
Atlanta Brush Co.
Southwestern Broom Mfg. Co.

MOTION PICTURES.
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MOTORS AND GENERATORS—ELECTRIC.
Allis-Chalmers Mfg. Co.
American Blower Co.
Carter Electric Co.
Curtis Co., The.
Fulton Supply Co.
General Electric Co.
Nashville Industrial Corp.
Southern Electric Supply Co.
Sturtevant Co., B. F.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

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NAPPER CLOTHING.
Philadelphia Felt Co.

NAPPER ROLL GRINDING MACHINES.
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MUSICAL INSTRUMENTS.
Cable Piano Co.
Conn, Ltd., C. G.

NEEDLES—KNITTING.
Torrington Co.

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Atlanta Stamp & Stencil Wks.
Dixie Seal & Stamp Co.
Jacobs & Co.
Knapp Fence Co.
Lupton's Sons Co., David.
Monroe Calculating Mch. Co.
Royal Metal Mfg. Co.
Smith & Bros. Typewriter Co.
Sanymetal Products Co.

OFFICE PARTITIONS.
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OIL—LUBRICATING.
Johnson & Co., Inc., Oliver.
Lamson Oil Co., Inc.
Texas Co.
Texas Co.
Wadsworth, Howland & Co., Inc.

OIL ENGINES.
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Oxweld Acetylene Co.
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Lewis Co., G. B.

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Detroit Graphite Co.
DeVilbiss Mfg. Co.
Dixon Crucible Co., Jos.
Hockaday Co.
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Sonneborn Sons, Inc., L.
St. Louis Surfacer & Paint Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

PAINT SPRAYING EQUIPMENT.
DeVilbiss Mfg. Co.

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Dowman-Dozier Mfg. Co.
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Knapp Fence Co.
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Sanymetal Products Co.

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PEROXIDES.
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Scaife & Sons Co., Wm. B.
Walker Electric & Plbg. Co.

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Fulton Supply Co.

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Detroit Belt Lacer Co.
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PRESSURE GAUGES.
(See Gauges.)

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Showalter Printing Co., A. J.

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Renold, Inc., Hans.

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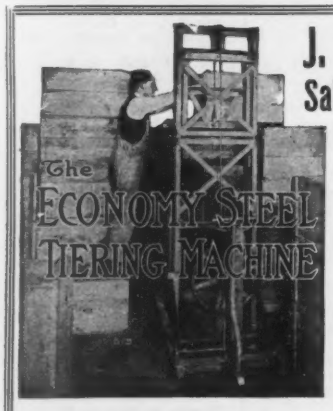

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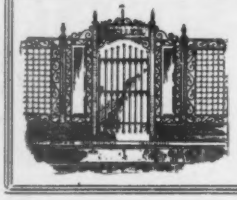

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General Electric Co.
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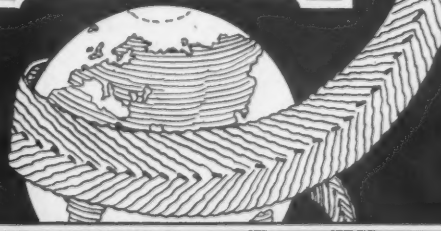

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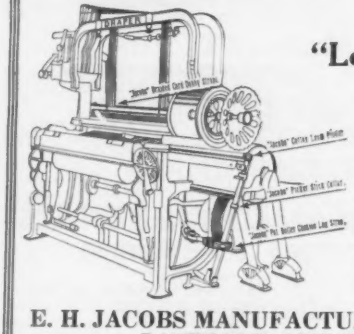

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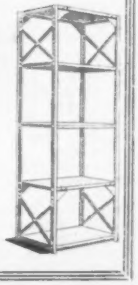

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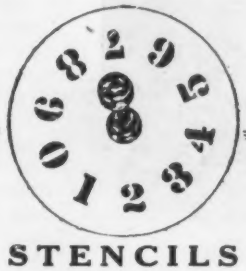

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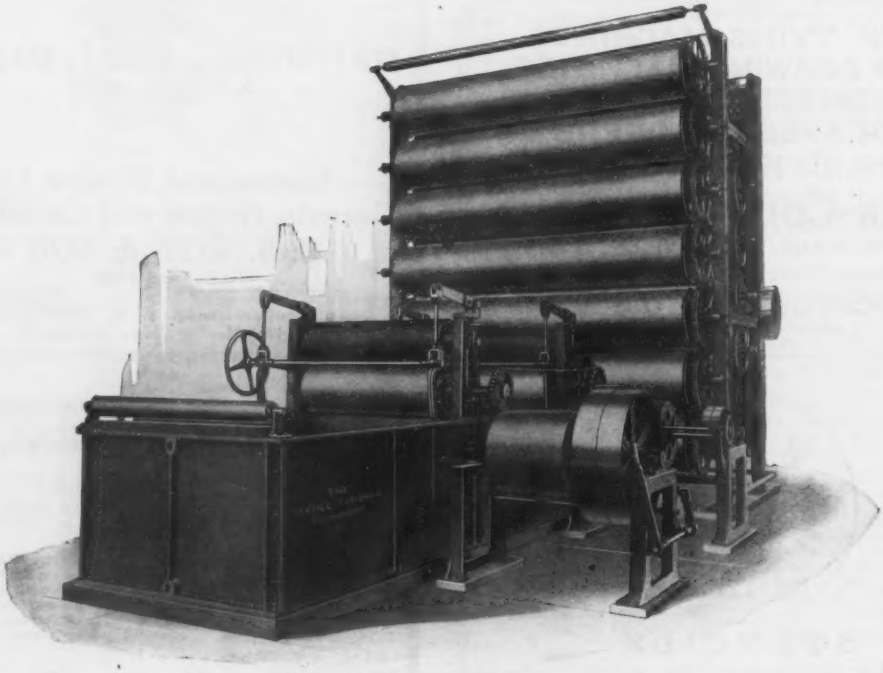

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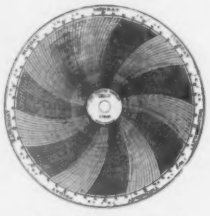

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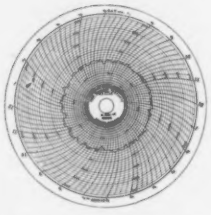

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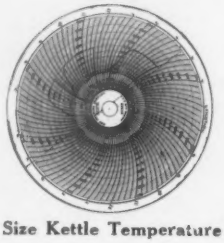

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